Telephony

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# THE STORY OF OHIO

*The Third of a Series of Articles Dealing with the Telephone Development of the States*

By Frank L. Beam

IN 1885 the great state of Ohio, with a population of more than 4,000,000 people, had fewer than 45,000 telephones in service, about one-half of the eighty-eight counties were without telephone exchanges, and quite a number even were without toll stations. Every exchange and toll station at that time was controlled by the Bell monopoly. The number was small compared with the number of exchanges and toll stations that exist to-day and are now indispensable to the people of the state. The Bell company, having absolute control of the telephone situation — not only in Ohio but throughout the entire country— was charging exorbitant rates for a very limited service, and seemed perfectly satisfied so far as its income was concerned, and for that reason did not care to develop the state as it should, to give more and better service, or to make rates so that the masses could enjoy the benefit of telephone service. With high rates and unsatisfactory service the crisis had to come, for the telephone became a necessity to the business man.

Building of the Cuyahoga Telephone Company, Cleveland, Ohio.

Thus, in 1895 the Independent telephone development was spontaneous throughout the state. Every section of the country had suffered from the same treatment. The people were through with the Bell monopoly, and the idea of installing Independent exchanges by local men and the organization of home telephone companies spread through the state like wildfire. The idea of the Independent telephone movement appealed to the heart of every business man. It was his privilege to become financially interested in these companies, and to have a word to say about the control of their affairs. There was a spirit of freedom about the Independent movement, something of the spirit of '76, which had made it progress more in the first two years than the Bell had in the eighteen years of its existence in the state.

However, at that time it took men with courage to enter the field against an opponent with a complete organization, with unlimited financial backing and resources second only in strength to those of the Standard Oil Company. The Bell company had in view, as its one aim, the annihilation of the Independent companies. The monopoly attempted to block any local organization, by sending infringement notices to subscribers, stating that they were liable to suit under the patent laws of the United States. The Bell company attempted to bribe or buy all local companies. Not meeting with success on this line, the Bell licensees immediately reduced their rates, and in many places even installed telephones without a contract, and gave absolutely free service for an indefinite time. During the first few years, while the Independents were struggling to gain a footing, the Bell companies seemed to have control of the

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press, which was used, along with every other agency that could be thought of, to block the progress of Independent development, but they had permitted it to go too far. People of the state had suffered abuses enough at the hands of the Bell monopoly, and now they had an opportunity to remedy their grievance. The treatment received by the people from this scheming corporation is still fresh in the memory of everyone. The patents controlled by the Bell company had not fully expired when franchises were granted to local people in the following places: Lorain, Mount Vernon, Newark, Chillicothe and Norwalk. Other cities and towns followed in rapid succession, until the entire state is now developed, with the exception of Hamilton county.

At Lorain the Bell company had absolutely refused to install an exchange, figuring that the amount of business to be secured at that place would not justify the investment. To-day Lorain has the distinction of being the largest city in the state without a Bell exchange, and the Independent home company there is operating over twenty-five hundred telephones.

The city of Cleveland, before the Bell company had competition, had in service fewer than 5,000 telephones. To-day Cleveland has over 45,000 telephones, and of this number the Cuyahoga Telephone Company (Independent) is operating over 25,000. To-day there are more telephones in service in Cleveland than the Bell company had in the entire state of Ohio in 1895.

In fact if the gain for the first six months of this year is equal to that of 1906, there will be more Independent telephones in service in Ohio than the Bell company had in the United States in 1896!

Columbus, with a population of over 125,000, in 1899 had fewer than 1,800 telephones in service. As a result of competition, its citizens enjoy telephone service to-day to the extent of over 18,000 telephones; the Columbus Citizens' Telephone Company (Independent) having over 10,000 of this number on its exchanges, with an addition of over 3,000 in Franklin county.

In the city of Wooster the Bell company installed an exchange. On account of high rates charged it could not get subscribers enough to pay expenses. Wooster has a population of about 8,000 people. The Independents are now operating an exchange there with over 1,300 subscribers.

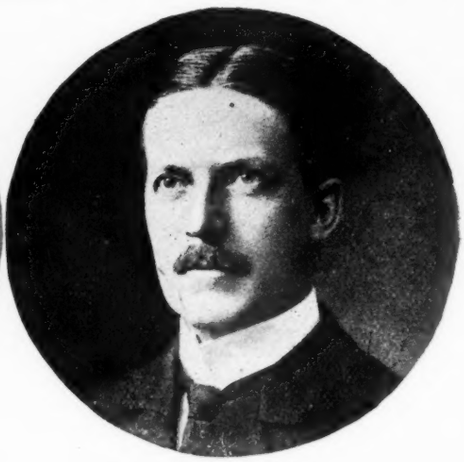
Frank L. Beam.
President Ohio Independent Telephone Association.

The same satisfactory account can be given of the Independent telephone companies in Toledo and Dayton, and, in fact, of all cities and towns in the state. At this time, there are over 500 incorporated telephone companies operating in Ohio. You will notice by the last report of the Ohio Independent Association, which is included in this article, that these companies are operating 835 exchanges, 1,663 toll stations, and over 270,000 telephones. The toll business at first was taken care of by each company building its proportion of line. This system was satisfactory so far as local tolls were concerned —that is, messages originatting and destined to points in the same county—but for long-distance messages this plan did not prove satisfactory. At this time, the United States Long-Distance Company was organized, and came to the rescue, contsructing toll lines over the state, using nothing but the best material and all copper circuits. With the local toll lines and the United States long-distance lines, the state is covered with a network of wires. A map of Ohio showing the toll lines accompanies this article. Conservative estimates show the Independent companies are doing over 80 per cent of all the telephone business, both exchange and long-distance, in the state.

Early in the development it was discovered there was a flaw in the Independent system. Differences were arising

Hon. James B. Hoge.

The Late James M. Thomas.

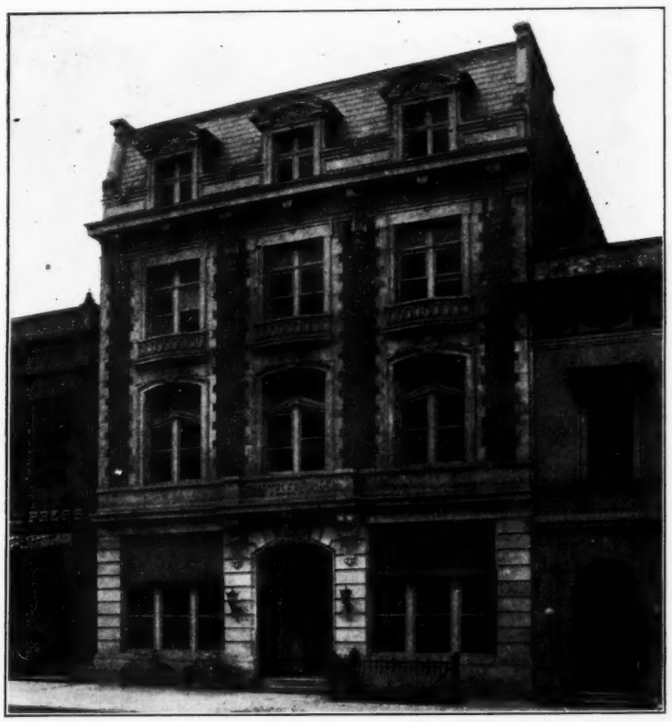


Hon. H. D. Critchfield.

between the local companies in regard to the toll rates, division of tolls, territorial rights and many questions that were difficult to settle without calling in disinterested parties.

Columbus Citizens Telephone Company's Building, Columbus, Ohio.

There was no executive department connected with this system to control its general affairs, and with the local companies in their fight against the Bell, the old adage of "United we stand, divided we fall" was becoming more evident every day. To the far-sighted Independent telephone



Toledo Home Telephone Company's Building, Toledo, Ohio.

man, a state association of the Independent companies was the solution of the problem. In tracing the Independent Telephone Association of the state of Ohio we may justly say it had its beginning with the telephone movement itself. Everyone felt that if a fight was to be carried on successfully against the monopoly, there must necessarily be the hearty co-operation of every Independent company in the state. Accordingly, the first meeting was called in Columbus during the spring of 1896. The late Judge James M. Thomas was elected the first president of the Ohio Independent Telephone Association, and Mr. Harry D. Critchfield was elected secretary. The principal work of the association at that time was to encourage the building of exchanges, the development of territory, etc. Judge Thomas was re-elected president each succeeding year until 1902, when W. Gilbert Thompson, of Hamilton, was elected and

Dayton Home Telephone Company's Building, Dayton, Ohio.

served for two years. The writer of this article was elected president of the association in 1904. At that time the "Ohio idea" was adopted, to divide the state into districts with a vice-president for each district. This plan has proved a great success, and has been adopted by many other states.

The wonderful growth and success of the Independent companies of Ohio have been dependent upon two facts: First, reasonable rates and good service; second, because the stockholder has deemed it his own personal interest to

Building of the Akron Peoples' Telephone Company, Akron, Ohio.

look out for the development and progress of the local company in every detail. The stockholders represent every financial enterprise in the state—the banker, merchant, manufacturer, lawyer, and the farmer. In every sense of

the word it has been a home enterprise, and as a necessary result of that loyalty instilled in the heart of all American citizens, a home enterprise always receives encouragement and support of its own local people. Another important fact that should not be overlooked is that the Independent telephone companies were the first to extend their service to the rural districts so that to-day almost every farmer of consequence has direct communication with his neighbor and toll line service the same as the most important business house in the country.

A conservative estimate has been made showing that there has been an investment of over $35,000,000 in Independent telephone construction in Ohio. This vast amount of money has been put up by over twenty-four thousand stockholders, who, by being financially interested, give the Independent telephone movement a strong backing and a guarantee of future success.

The latest statistical report of the Ohio Independent Telephone Association gives an interesting comparison showing, by counties, the number of Independent and Bell

Map Showing the Independent Telephone Exchanges and Toll Lines in the State of Ohio in 1901.

telephones now installed. The figures are truly eloquent of the phenomenal manner in which the Independents have passed the monopoly in the race for supremacy in the telephone industry of Ohio. The following brief summary tells the story:

Total number of Independent telephones in service in the state, 270,720.

Total number of Bell telephones in service in the state, 141,111.

Total number of Independent exchanges, 835.

Total number of Bell exchanges, 275.

Total number of Independent toll stations, 1,663.

Total number of Bell toll stations, 839.

Between March 30, 1905, and October 1, 1906, a period

MICHIGAN
PROVINCE OF ONTARIO
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Statistical Report of the Ohio Independent Telephone Association Columbus, Ohio
Reported to March 29, 1906
Independent Telephones, 248,304; Exchanges, 797; Toll Stations, 1,705; Stockholders, 21,748
Bell Telephones, 130,080; Exchanges, 261; Toll Stations, 891
Reported to March 30, 1905
Independent Telephones, 196,837; Exchanges, 668; Toll Stations, 1,452; Stockholders, 17,029
Bell Telephones, 104,318; Exchanges, 159; Toll Stations, 743
Growth—12 months—March 30, 1905—March 29, 1906
Independent Telephones, 51,367; Exchanges, 129; Toll Stations, 253; Stockholders, 4,719
Bell Telephones, 25,762; Exchanges, 102; Toll Stations, 184
Excess March 29, 1906 of Independent over Bell
Independent Telephones, 118,224; Exchanges, 536; Toll Stations, 814
Percentage of Excess Independent over Bell
Independent Telephones, 98%; Exchanges, 200%; Toll Stations, 83%
MAP OF THE STATE OF OHIO SHOWING INDEPENDENT TELEPHONE TOLL LINES
—KEY—
Class A. No 2 and no copper wire.
Class B. No 12-14 copper and all iron wire
Proposed construction.
Compiled By THE NATIONAL INTERSTATE TELEPHONE ASSOCIATION. Cleveland, Ohio.

Map Showing the Independent Telephone Exchanges and Toll Lines in the State of Ohio in 1906.

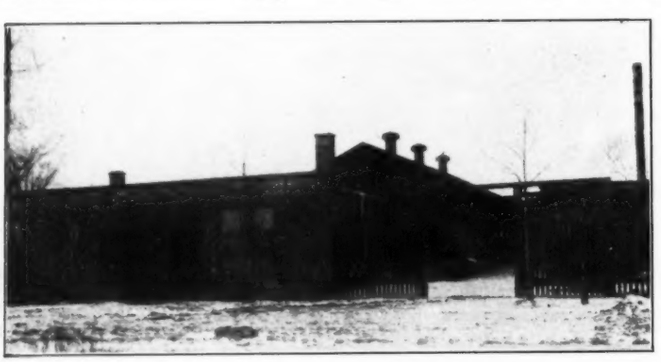
Marion County Telephone Company's Building, Marion, Ohio.

Factory North Electric Company, Cleveland.

of eighteen months, the number of Independent telephones increased nearly 74,000, the number of exchanges 167, and the number of toll stations 211.

The official report by counties follows:

| Counties. | Telephones | Exchanges | Toll Stations | Stock Holders | Telephones | Exchanges | Toll Stations |
|---|---|---|---|---|---|---|---|
| Adams | 500 | 4 | 21 | 15 | 487 | 3 | 5 |
| Allen | 5,124 | 10 | 12 | 611 | 1,962 | 2 | 14 |
| Ashland | 2,723 | 15 | 4 | 710 | 5 | 1 | 9 |
| Ashtabula | 5,508 | 24 | 25 | 1,693 | 705 | 3 | 12 |
| Athens | 2,993 | 13 | 41 | 554 | 1,408 | 7 | 23 |
| Auglaise | 2,573 | 8 | 2 | 303 | .... | .. | 4 |
| Belmont | 2,959 | 16 | 10 | 216 | 926 | 5 | 7 |
| Brown | 475 | 4 | 10 | 240 | 400 | 5 | 15 |
| Butler | 4,087 | 10 | 76 | 360 | 2,349 | 4 | .. |
| Carroll | 1,247 | 16 | 20 | 40 | 114 | 2 | 8 |
| Champaign | 2,897 | 9 | 15 | 136 | 274 | 2 | 11 |
| Clark | 3,793 | 7 | 7 | 99 | 4,500 | 13 | 34 |
| Clermont | 1,170 | 12 | 60 | 75 | 800 | 7 | 7 |
| Clinton | 2,400 | 6 | 19 | 25 | 500 | 5 | 7 |
| Columbiana | 4,178 | 19 | 40 | 204 | 2,500 | 9 | 16 |
| Coshocton | 2,150 | 7 | .... | 16 | 900 | 4 | 8 |
| Crawford | 2,200 | 4 | 11 | 60 | 400 | 1 | .. |
| Cuyahoga | 25,990 | 20 | 35 | 1,097 | 27,500 | 16 | 19 |
| Darke | 4,900 | 11 | 37 | 155 | 62 | 1 | 18 |
| Defiance | 2,364 | 9 | .... | 492 | 368 | 1 | 6 |
| Delaware | 2,718 | 8 | 7 | 182 | 400 | 3 | 4 |
| Erie | 2,438 | 7 | 17 | 134 | 1,409 | 2 | 8 |
| Fairfield | 1,749 | 7 | 8 | 35 | 1,460 | 6 | 7 |
| Fayette | 1,725 | 5 | 18 | 10 | 500 | 2 | 4 |
| Franklin | 11,807 | 16 | 30 | 170 | 9,500 | 6 | 18 |
| Fulton | 2,460 | 9 | 15 | 150 | .... | .. | 5 |
| Gallia | 3,117 | 19 | 45 | 2,009 | 230 | 2 | 5 |
| Geauga | 2,520 | 13 | 25 | 442 | .... | .. | 6 |
| Greene | 2,057 | 6 | 6 | 56 | 1,205 | 4 | 32 |
| Guernsey | 2,925 | 11 | 53 | 107 | 800 | 1 | 13 |
| Hamilton | 171 | 2 | .... | 171 | 20,000 | 5 | 10 |
| Hancock | 1,438 | 2 | 7 | 20 | 1,900 | 1 | .. |
| Hardin | 3,014 | 8 | 5 | 178 | 365 | 2 | 10 |
| Harrison | 1,325 | 10 | 30 | 205 | 235 | 2 | 10 |
| Henry | 1,770 | 11 | .... | 31 | 53 | 1 | 5 |
| Highland | 1,950 | 5 | 12 | 225 | 900 | 6 | 9 |
| Hocking | 702 | 1 | 3 | 51 | 225 | 1 | 3 |
| Holmes | 1,446 | 12 | 13 | 171 | .... | .. | 1 |
| Huron | 3,554 | 13 | 20 | 360 | 600 | 1 | 15 |
| Jackson | 30 | 1 | 3 | 5 | 525 | 4 | 15 |
| Jefferson | 2,071 | 21 | 26 | 443 | 1,188 | 2 | 11 |
| Knox | 3,212 | 8 | 27 | 208 | 970 | 4 | 8 |
| Lake | 1,882 | 10 | 20 | 451 | 398 | 2 | 13 |
| Lawrence | 1,765 | 10 | 3 | 150 | 675 | 2 | .. |
| Licking | 4,277 | 11 | 12 | 277 | 1,000 | 2 | 10 |
| Logan | 3,500 | 14 | 32 | 229 | 300 | 2 | 16 |
| Lorain | 5,979 | 15 | 32 | 250 | 921 | 1 | 7 |
| Lucas | 11,610 | 7 | 29 | 181 | 5,971 | 6 | 5 |
| Madison | 1,847 | 9 | 37 | 216 | 200 | 1 | 8 |
| Mahoning | 3,490 | 8 | 11 | 65 | 2,340 | 4 | 3 |
| Marion | 3,165 | 8 | 3 | 127 | 1,880 | 9 | .. |
| Medina | 2,490 | 11 | 2 | 428 | 150 | 1 | 1 |
| Meigs | 3,830 | 18 | 14 | 3,506 | 900 | 3 | 3 |
| Mercer | 3,069 | 18 | 17 | 1,308 | .... | .. | 13 |
| Miami | 5,172 | 13 | 25 | 310 | 150 | 1 | 4 |
| Monroe | 778 | 8 | 10 | 39 | 10 | 1 | 1 |
| Montgomery | 8,176 | 23 | 27 | 742 | 8,408 | 4 | 20 |
| Morgan | 2,200 | 7 | 12 | 19 | .... | .. | 1 |
| Morrow | 1,866 | 12 | 13 | 52 | 200 | 3 | 8 |
| Muskingum | 3,605 | 15 | 25 | 104 | 3,280 | 7 | 15 |
| Noble | 1,615 | 12 | 38 | 63 | 524 | 2 | 7 |
| Ottawa | 1,751 | 7 | 24 | 100 | 50 | 2 | 7 |
| Paulding | 1,176 | 6 | 13 | 42 | 185 | 1 | 6 |
| Perry | 300 | 1 | 4 | 26 | 1,531 | 7 | 10 |
| Pickaway | 1,514 | 4 | 29 | 38 | 641 | 2 | 12 |
| Pike | 500 | 4 | 10 | 15 | 17 | 1 | .. |
| Portage | 2,315 | 8 | 18 | 180 | 400 | 1 | 14 |
| Preble | 2,513 | 13 | 3 | 182 | 100 | 1 | 12 |
| Putnam | 1,871 | 12 | 19 | 25 | 1,871 | 12 | 19 |
| Richland | 4,587 | 8 | 18 | 141 | 1,890 | 4 | 4 |
| Ross | 2,324 | 4 | 42 | 100 | 725 | 3 | 20 |
| Sandusky | 3,239 | 4 | 8 | 134 | 405 | 1 | 5 |
| Scioto | 1,717 | 3 | .... | 29 | 550 | 2 | .. |
| Seneca | 1,751 | 4 | 6 | 65 | 1,020 | 1 | 4 |
| Shelby | 1,597 | 5 | 20 | 87 | 160 | 1 | 16 |
| Stark | 6,732 | 10 | 36 | 254 | 4,420 | 8 | 29 |
| Summit | 4,873 | 8 | 27 | 126 | 3,200 | 4 | 16 |



Factory Norton Tool Company, West Park, Ohio.

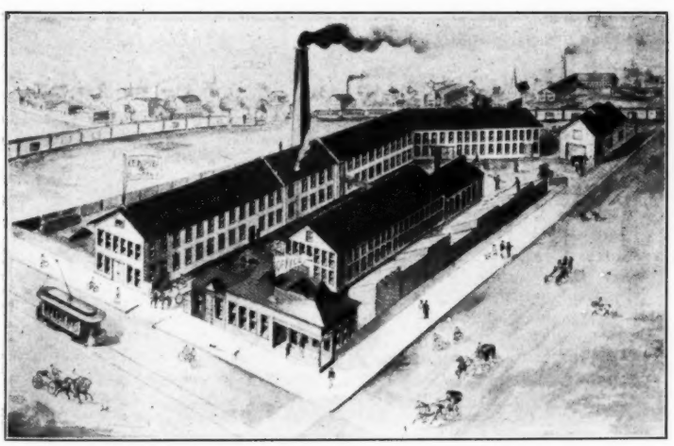
Factory Dean Electric Company, Elyria, Ohio.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Trumbull | 3,174 | 16 | 28 | 554 | 1,328 | 3 | 17 |
| Tuscarawas | 4,759 | 8 | 15 | 77 | 840 | 3 | 15 |
| Union | 1,622 | 10 | 14 | 35 | 25 | 1 | 4 |
| Van Wert | 2,789 | 10 | 18 | 324 | .... | .. | 7 |
| Vinton | 650 | 5 | 6 | 8 | 93 | 1 | 3 |
| Warren | 1,136 | 6 | 18 | 200 | 542 | 2 | 28 |
| Washington | 2,140 | 11 | 50 | 54 | 1,475 | 3 | 21 |
| Wayne | 3,556 | 18 | 16 | 344 | .... | .. | 4 |
| Williams | 2,623 | 11 | 18 | 139 | 179 | 1 | 13 |
| Wood | 2,700 | 10 | 20 | 340 | 2,280 | 9 | 6 |
| Wyandotte | 1,065 | 2 | 6 | 50 | 1,200 | 4 | .. |
| Totals | 270,720 | 835 | 1,663 | 24,650 | 141,111 | 275 | 839 |

An analysis of the above table brings out some startling facts. For instance, it shows, while there is not a county in

Factory W. G. Nagel Electric Company, Toledo, Ohio.

the state with less than thirty Independent telephones, and only two with less than 200, there are eight counties that haven't a single Bell telephone within their boundaries. Auglaise has no Bell telephones but has 2,573 Independent, Fulton county has no Bell telephones but has 2,460 Independents, Geauga has no Bell telephones but has 2,520 Independents, and so on through the list of eight "Bell-less" counties. Only in Hamilton county has the Bell any ma-



Factory of F. E. Kohler & Company, Canton, Ohio.

terial claim to superiority and that is due to the fact that Hamilton county includes the city of Cincinnati. However, Cincinnati, like Boston, Chicago, Milwaukee, Denver and Omaha, is surely destined to be captured by the Independents in the near future, for the telephone public there are tired of the Bell monopoly and ready to welcome competition. The following table shows the companies which are affiliated with the Ohio State Independent Telephone Association, and the nine district organizations:

DISTRICT NO. 1.

E. G. Miller, vice-president, Warren,
Andover Electric Telephone Company, Andover.
Ashtabula Telephone Company, Ashtabula.
Bainbridge Telephone Company, Chagrin Falls.
Bellevue Home Telephone Company, Bellevue.
Citizens' Telephone Company, Berea.
Burton Telephone Company, Burton.
Brunswick Independent Telephone Company, Brunswick.
Chagrin Falls Telephone Company, Chagrin Falls.
Chardon Telephone Company, Chardon.
Claridon Telephone Company, Claridon.
Cuyahoga Telephone Company, Cleveland.
U. S. Telephone Company, Cleveland.
Collinwood Home Telephone Company, Collinwood.
Conneaut Telephone Company, Conneaut.
Elyria Southern Telephone and Telegraph Company, Elyria.
Elyria Telephone Company, Elyria.
Galion Telephone Company, Bellevue.
Madison Telephone Company, Geneva.
Huron Telephone Company, Huron.
Jefferson & Warren Telephone Company, Orangeville.
Black River Telephone Company, Lorain.
Local Telephone Company, Bellevue.
Medina Telephone Company, Medina.
Mentor Telephone Company, Mentor.
Newbury Telephone Company, Newbury.
Newton Falls Telephone Company, Newton Falls.
North Ridgeville Telephone Company, North Ridgeville.
Oberlin Telephone Company, Oberlin.
Painesville Telephone Company, Painesville.
Sandusky Telephone Company, Sandusky.
Spencer Telephone Company, Spencer.
Vermillion Telephone Company, Vermillion.
Star Telephone Company, Wadsworth.
Warren & Niles Telephone Company, Warren.
Wellington Telephone Company, Wellington.
Willoughby Telephone Company, Willoughby.
Amherst Home Telephone Company, North Amherst.
Clinton Air Line Telephone Company, Fitchville.
Clarksfield Independent Telephone Company, Clarksfield.
Co-operative Telephone Company, North Madison.
Trumbull Telephone Company, Trumbull.
Covell, F. M., Rock Creek.
Local Telephone Company of Bellevue, Berlin Heights.
Leroy Telephone Company, Leroy.
Perry Telephone Company, Perry.
Chatham Telephone Company, Chatham.
Phalanx & Leavittsburg Telephone Company, Phalanx.
Hartsgrove Telephone Company, Hartsgrove.
Thompson Telephone Company, Thompson.
Dorset-Sentinel Telephone Company, Dorset.
Cherry Valley Telephone Company, Cherry Valley.
East New Lynn & Sentinel, Jefferson.
Austinburg Telephone Company, Austinburg.
Kirtland Telephone Company, Willoughby.
Orrville Telephone Company, Orrville.
Windsor Telephone Company, Windsor.
Colebrook Telephone Company, Colebrook.
Rome Telephone Company, Rome.
Cook Telephone Company, R. F. D., Geneva.
Wayne Telephone Company, R. F. D., West Williamsfield.
West Richfield Telephone Company, West Richfield.
Home Telephone Company, Fairport Harbor.
North Bloomfield Telephone Company, North Bloomfield.
Mesopotamia Telephone Company, Mesopotamia.
Green Telephone Company, Green.
Champion Telephone Company, Champion.
Gustavus Telephone Company, Gustavus.
Johnston Telephone Company, Johnston.
Independent Telephone Company, Liverpool.
Medina County Farmers' Telephone Company, Medina.
Parkman Telephone Company, Parkman.
Riverside Telephone Company, Birmingham.

DISTRICT NO. 2.

W. F. Laubach, vice president, Akron.
Crescent Telephone Company, Leesville.
Palermo Telephone Company, Palermo.
Petersburg Telephone Company, Petersburg.
Columbiana County Telephone Company, Salem.
Damascus Telephone Company, Damascus.
Eastern Ohio Telephone Company, East Rochester.
Fairfield Township Mutual Telephone Company, Columbiana.
Island Mutual Telephone Company, Columbiana.
North Georgetown Telephone Company, North Georgetown.
Salem Township Mutual Telephone Company, Leetonia.
Winona Central Telephone Company, Winona.
Cadiz Junction Telephone Company, Means.

Conotton Valley Telephone Company, Jewett.
Farmers' Home Telephone Company, Hopedale.
Freeport Home Telephone Company, Freeport.
Harrison County Telephone Company, Cadiz.
Harrisville Telephone Company, Harrisville.
Moorefield & Caseville Telephone Company, Moorefield.
Adena Exchange Telephone Company, Adena.
Bergholz Telephone Company, Bergholz.
Bloomingdale Telephone Company, Bloomingdale.
East Springfield Telephone Company, East Springfield.
Farmers' Independent Telephone Company, Reeds Mills.
Island Creek Telephone Company, Steubenville, R. F. D. No. 1.
Ohio Valley Telephone and Telegraph Company, Brilliant.
Steubenville-Phœnix Telephone Company, Steubenville.
Wellsburg Home Telephone Company, Brilliant.
Beaver Telephone Company, North Lima.
North Benton & Deerfield Telephone Company, North Benton.
Youngstown Telephone Company, Youngstown.
Portage County Telephone Company, Ravenna.
Bunker Hill Telephone Company, Justus.
Farmers' & Merchants' Telephone Company, Paris.
Massillon Telephone Company, Massillon.
Mutual Telephone Company, Beach City.
Stark County Telephone Company, Canton.
Tri-County Telephone Company, Lake.
Valley Telephone Company, Wilmot.
Akron People's Telephone Company, Akron.
Summit Rural Telephone Company, Akron.
Berlin Telephone Company, Berlin.
Fiat Telephone Company, Fiat.
Tuscarawas County Telephone Company, New Philadelphia.

DISTRICT NO. 3.

J. B. Rhodes, vice president, Zanesville.
Albany & Vales Mills Telephone Company, Albany.
Amesville Telephone Company, Amesville.
Athens County Telephone Company, Athens.
Ohio Valley Telephone Company, Bellaire.
Belmont Telephone Company, Bridgeport.
Cambridge Home Telephone Company, Cambridge.
Colerain Telephone Company, Colerain.
Home Telephone Company, Coolville.
Cumberland Independent Telephone Company, Cumberland.
Citizens' Telephone Company, Coshocton.
Crooksville Telephone Company, Crooksville.
Union Telephone Company, Fairview.
Flushing Home Telephone Company, Flushing.
Gallipolis Telephone Company, Gallipolis.
Sunday Creek Telephone Company, Glouster.
Union Telephone Company, Glouster.
Marshfield Telephone Company, Marshfield.
Riverside Telephone Company, McConnellsville.
New Concord Telephone Company, New Concord.
Zanesville Telephone Company, Zanesville.
Clarington Home Telephone Company, Clarington.
Enterprise Telephone Company, Bellaire.
Guysville Telephone Company, Guysville.
Jerseyville Telephone Company, Shade.
Marietta Telephone Company, Marietta.
Pleasant City Telephone Company, Pleasant City.
People's Telephone Company, Bartlett.
Point Rock & Wilkesville Telephone Company, Point Rock.
Quaker City Telephone Company, Quaker City.
Richland Home Telephone Company, Lamira.
Stockport-Marietta Telephone Company, Watertown.
Barlow & Watertown Telephone Company, Watertown.
Summerfield Telephone Company, Summerfield.
Adamsville Telephone Company, Adamsville.
Gratiot & Brownsville Telephone Company, Gratiot.
Citizens' Telephone Company, Rutland.
Bremen Telephone Company, Bremen.
People's Telephone Company, Chesterhill.
Noble County Telephone Company, Caldwell.
Shade Telephone Company, Shade.
Farmers' & Merchants' Telephone Company, Warsaw.
Woodsfield Telephone Company, Woodsfield.
Young Hickory Telephone Company, Young Hickory.

DISTRICT NO. 4.

G. P. Thorpe, vice president, Wilmington.
Home Telephone Company, Chillicothe.
Citizens' Telephone Company, Circleville.
Clinton Telephone Company, Wilmington.
Greenfield Home Telephone Company, Greenfield.
Home Telephone Company, Ironton.
Jackson County Home Telephone Company, Jackson.
McArthur Telephone Company, McArthur.
Portsmouth Telephone Company, Portsmouth.
Ray & Vigo Telephone Company, Ray.
Washington Home Telephone Company, Washington Court House.
Home Telephone Company, Waverly.
Hillsboro Telephone Company, Hillsboro.
Lecta Citizens' Telephone Company, Lecta.
Manchester Telephone Company, Manchester.
Wellston, Mineral & Athens Telephone Company, Lone Star.
Yankee St. Telephone Company, Wilkesville.
Citizens' Telephone Company, Mowrystown.
Ohio Valley Telephone Company, Proctorville.
Careytown Home Telephone Company, Careytown.
Colerain Telephone Company, Hallsville.
Adams County Telephone Company, Waverly.
Rarden Mutual Joy Telephone Company, Rarden.
Getaway Telephone Company, Getaway.
Buffalo Telephone Company, Burlington.

DISTRICT NO. 5.

W. Gilbert Thompson, vice president, Hamilton.
Citizens' Telephone Company, Batavia.
Eaton Telephone Company, Eaton.
Hamilton Home Telephone Company, Hamilton.
Valley Telephone Company, Lebanon.
Oxford Telephone Company, Oxford.
Preble County Telephone Company, West Alexandria.
Home of College Corners, College Corners.
Morning Sun Telephone Company, Morning Sun.
Camden Telephone Company, Camden.

DISTRICT NO. 6.

L. H. Thedieck, vice president, Sidney.
United Telephone Company, Bellefontaine.
Bradford Telephone Company, Gettysburg.
Cedarville Telephone Company, Cedarville.
Covington Home Telephone Company, Covington.
Home Telephone Company, Dayton.
Germantown Independent Telephone Company, Germantown.
Jackson Center Telephone Company, Jackson Center.
London Home Telephone Company, London.
Mechanicsburg Telephone Company, Mechanicsburg.
Mt. Sterling Telephone Company, Mt. Sterling.
Piqua Home Telephone Company, Piqua.
Home Telephone Company, Plain City.
St. Paris Telephone Company, St. Paris.
Sidney Telephone Company, Sidney.
Springfield-Xenia Telephone Company, Springfield.
Troy Telephone Company, Troy.
Urbana Telephone Company, Urbana.
Greenville Home Telephone Company, Greenville.
Farmers' Telephone Company, Farmersville.
North Lewisburg Telephone Company, North Lewisburg.
West Milton Home Telephone Company, West Milton.
Champaign Telephone Company, Rosewood.
New Lebanon Telephone Company, New Lebanon.
Home Telephone Company, Plattsburg.
Yorkshire Telephone Company, Yorkshire.
Botkins Telephone Company, Botkins.
New Knoxville Telephone Company, New Knoxville.
Johnsville Telephone Company, Johnsville.
Bloomer Telephone Company, Bloomer.
South Charleston Telephone Company, South Charleston.
Hollandsburg Home Telephone Company, West Jefferson.
Citizens' Telephone Company, West Jefferson.

DISTRICT NO. 7.

George H. Metheany, vice president, Lima.
Ada Telephone Company, Ada.
Antwerp Telephone Company, Antwerp.
Bluffton Telephone Company, Bluffton.
Buckland Mutual Telephone Company, Buckland.
Carey Electric Company, Carey.
Celina & Mercer County Telephone Company, Celina.
Convoy Home Telephone Company, Convoy.
Cridersville Telephone Company, Cridersville.
Elida Mutual Telephone Company, Elida.
Delphos Home Telephone Company, Delphos.
Findlay Home Telephone Company, Findlay.
Ft. Recovery Telephone Company, Ft. Recovery.
Kenton Telephone Company, Kenton.
Lima Telephone and Telegraph Company, Lima.
Marion County Telephone Company, Marion.
Marion Telephone Company, Marie Stein.
Middlepoint Home Telephone Company, Middlepoint.
Mt. Victory Telephone Company, Mt. Victory.
Minster Home Telephone Company, Minster.
New Bremen Telephone Company, New Bremen.
Ohio City Home Telephone Company, Ohio City.
Paulding Home Telephone Company, Paulding.
Payne Home Telephone Company, Payne.
Rockford Telephone Company, Rockford.
St. Marys Telephone Company, St. Marys.
Scott Home Telephone Company, Scott.
Spencerville Telephone Company, Spencerville.
Upper Sandusky Telephone Company, Upper Sandusky.

Van Wert Home Telephone Company, Van Wert.
Wapakoneta Telephone Company, Wapakoneta.
Auglaise Telephone Company, Waynesfield.
Willshire Telephone Company, Willshire.
Marion Township Telephone Company, Scotts Crossing.
McComb Home Telephone Company, McComb.
United Farmers' Telephone Company, West Minster.
Beaver Dam Telephone Company, Beaver Dam.
Cavett Telephone Company, Cavett.
Wren Home Telephone Company, Wren.
Jennings Telephone Company, Converse.
Rockford Toll Line Telephone Company, Rockford.
Mercer County Mutual Telephone Company, Celina.
Putnam Telephone Company.

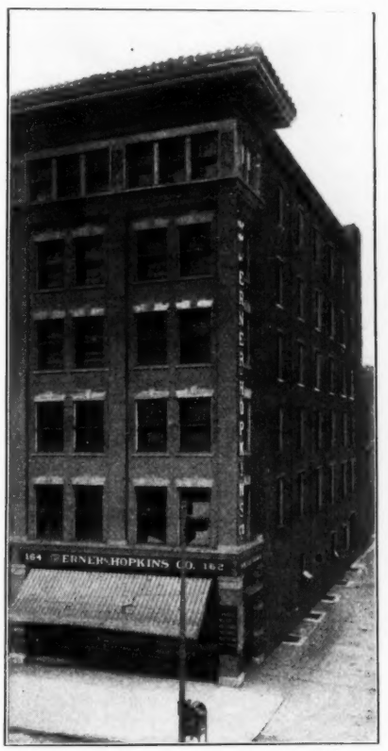
DISTRICT NO. 8.

R. E. Hamblin, vice president, Toledo.
Toledo Home Telephone Company, Toledo.
Seneca Telephone Company, Gibsonburg.
Edgerton Telephone Company, Edgerton.
Fayette Telephone Company, Fayette.
New Ottawa County Telephone Company, Elmore.
North Hamilton Home Telephone Company, Bellevue.
Carbon Telephone Lines, Bloomville.
Edon Telephone Company, Edon.
Flat Rock Telephone Company, Flat Rock.
Gibsonburg Electric Light Company, Gibsonburg.
Maumee Home Telephone Company, Maumee.
Whitehouse Home Telephone Company, Whitehouse.
Sylvania Telephone Company, Richland Center.
Oil Belt Telephone Company, Cygnet.
Fremont Home Telephone Company, Fremont.
Nina Home Telephone Company, Nina.
Helena Telephone Company, Helena.
Citizens' Telephone Company, West Unity.
Wood County Telephone Company, Bowling Green.
Napoleon Home Telephone Company, Napoleon.
Bryan Telephone Company, Bryan.
Weston Home Telephone Company, Weston.
Northwestern Ohio Telephone Company, Wauseon.
Ney Telephone Company, Ney.
Clyde Telephone Company, Clyde.
Greenspring Telephone and Electric Company, Greenspring.
Delta Home Telephone Company, Delta.
Hicksville Telephone Company, Hicksville.
Tiffin Home Telephone Company, Tiffin.
Archibold Telephone Company, Archibold.
Stryker Telephone Company, Stryker.
Packard Telephone Company, Malinta.
Grand Rapids Mutual Telephone Company, Grand Rapids.
Montpelier Telephone Company, Montpelier.
Citizens' Telephone and Message Company, Fostoria.
Citizens' Telephone Company, McClure.
State Lima Telephone Company, Weston.
Holland Rural Telephone Company, Holland.

DISTRICT NO. 9.

Dwight E. Sapp, vice president, Mt. Vernon.
Bucyrus Telephone Company, Bucyrus.
Franklin Telephone Company, Columbus.
Columbus Citizens' Telephone Company, Columbus.
Crestline Local Telephone Company, Crestline.
Citizens' Telephone Company, Delaware.
Johnstown & Croton Telephone Company, Johnstown.
Lancaster Telephone Company, Lancaster.
Logan Home Telephone Company, Logan.
Monroe Telephone Company, Lucas.
Mansfield Telephone Company, Mansfield.
Marysville Telephone Company, Marysville.
Mifflin & Widowville Telephone Company, Mifflinville.
M., W. & O. Telephone Company, Wooster.
Mt. Vernon Telephone Company, Mt. Vernon.
Newark Telephone Company, Newark.
Farmers' Telephone Company, Perrysville.
Pataskala & Hebron Telephone Company, Pataskala.
Richwood Telephone Company, Richwood.
Shelby Local Telephone Company, Shelby.
Sunbury & Galena Telephone Company, Sunbury.
Star Telephone Company, Ashland.
Utica & Homer Telephone Company, Utica.
Berlin Telephone Company, Berlin.
Doylestown Telephone Company, Doylestown.
Union Telephone Company, East Applecreek.
Kilbuck Telephone Company, Kilbuck.
Rippling Mutual Telephone Company, Shreve.
Marshallville & Rittman Telephone Company, Marshallville.
Kidron Telephone Company, Kidron.
Weilersville Home Telephone Company, Weilersville.
Smithville Telephone Company, Smithville.
Milford Center Telephone Company, Milford Center.
Plain City Telephone Company, Plain City.
Galion Telephone Company, Galion.
Gratiot & Brownsville Telephone Company, Gratiot.

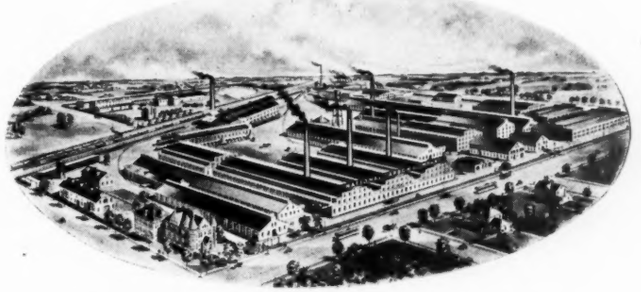
No more striking example of the wonderful growth of the Independent movement in Ohio is needed than that supplied by a comparison of the two maps incorporated in this article. One shows the telephone lines in operation in 1906. The other was printed by TELEPHONY in September, 1901. By contrasting the two a good idea can be gained of the great strides made in the last five years.




The Erner Hopkins Company, Columbus, Ohio

The telephone story of Ohio would not be complete without mention of some of the state's pioneers in Independent telephony. Men like the late James M. Thomas, E. L. Barber, J. S. Brailey, H. D. Critchfield and many others have contributed to the success of the movement in which they were so much interested. A younger generation has sprung up, but most of the older Independents, who are still young men, have vast interests to look after, and give their best efforts to the cause of better telephone service.

Some illustrations of exchange buildings owned by Independent operating companies are shown to illustrate the permanent character of this movement against Bell extortion and poor service. Some views of telephone and allied factories are shown for the same purpose. It is impossible to show them all, but the reader will get some idea of the immensity of the growth of the industry in Ohio from these illustrations.



Factory National Carbon Company Cleveland, Ohio.

## *SUBMARINE TELEPHONE EXPERIMENTS.*

Experiments began recently at Lake Constance with a submarine telephone constructed under Prof. Pupins' system. The cable connects Friedrichshafen on the northern shore of the lake in Wurtemburg and Romanshorn on the opposite shore, in Switzerland (a distance of about seventy miles and reaches a maximum depth of 820 feet). It was laid by the Siemens-Halske Company for the Bavarian Wurtembergian and Swiss telegraph departments. No information regarding the results has yet been made public.

# HINTS TO TECHNICAL WRITERS

*Suggestions to those Who Discuss the Art of Telephony*

By H. P. Clausen

THE writer on technical subjects for trade journals often is at a loss to decide on the subject which he will cover in a short article. Taking, for example, the art of telephony, the different divisions of the work may be broadly subdivided into ten classes, these being constructed from four master classes, viz.: The subscriber's station equipment, the line circuit, the central office equipment, and the power equipment. From these four master classes we may then construct the six remaining combinations.

Referring to Figure 1, we have at the left the four master classes, and in triangular form, immediately to the right, we have combined, first, the subscriber's station and line circuit, making a subscriber and line class combination. In the second place, we have combined the line circuit and central office and produced a line and central office combination. Third, we have combined the central office and power equipment, and produced a central office and power combination class.

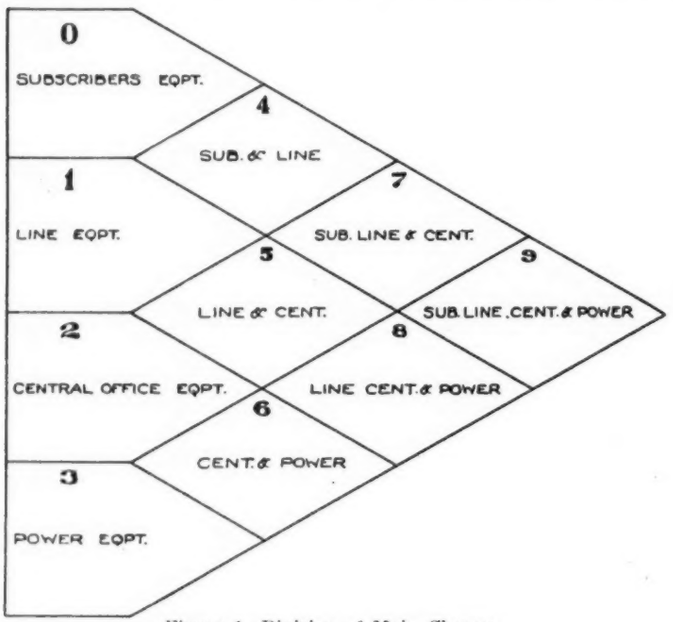



Figure 1—Division of Main Classes.

Obviously, it is not possible to cover all phases of telephone work by the addition of these three classes, but we may combine the line and subscriber's combination together with the line and central office combination and produce a subscriber's line and central office combination. In the same manner, the line circuit and the central office and power equipment may also be combined, producing the class line-central office and power equipment.

Finally, we may combine even the last two created combinations, which results in a subscriber's-line-central office and power division. Now, almost any phase of telephone work may be placed in any one of these divisions, which, for the sake of reference, we have marked as follows:

0.—Subscriber's Station Equipment.
1.—Line Circuit Equipment.
2.—Central Office Equipment.
3.—Power Equipment.
4.—Subscriber and Line Equipment.
5.—Line and Central Office Equipment.
6.—Central Office and Power Equipment.
7.—Subscriber, Line and Central Office Equipment.

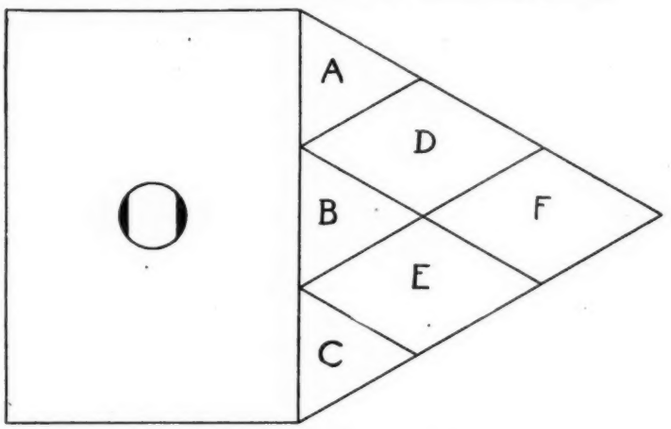



Figure 2—Analytical Division of Sub Classes.

8.—Line, Central Office and Power Equipment.
9.—Subscriber-Line-Central Office and Power Equipment.

From the above it will be observed that were we to construct a filing cabinet containing ten divisions, marked as shown above, it would be possible to place in these filing spaces various articles relating to telephony, and thus insure the immediate location of matters pertaining to a certain subdivision.

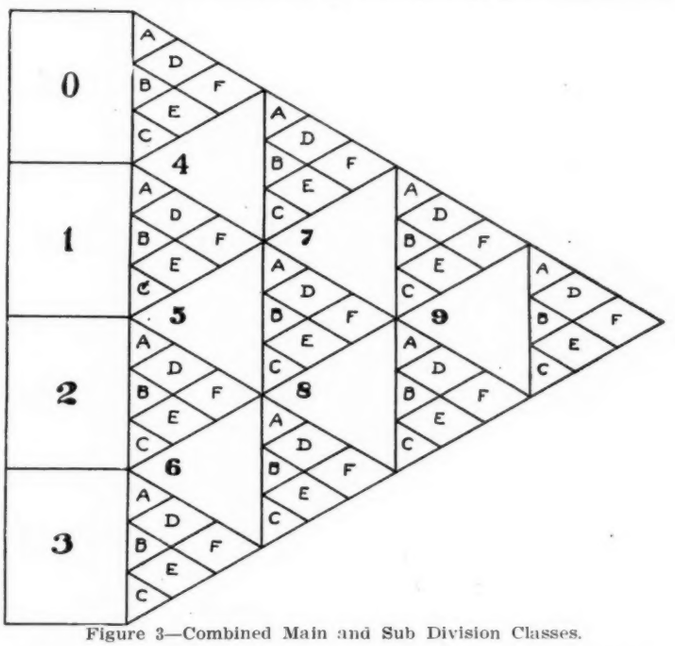



Figure 3—Combined Main and Sub Division Classes.

Now, then, in preparing an article for publication one could select any one of the ten classes and forge ahead. It is a fact often observed that new writers generally commence to write matter belonging in class 9, which, in pass-

ing it might be remarked, always stares one in the face when attempting to write articles after having prepared a first article which belongs in the division that practically covers the entire telephone field. Therefore, the primary point to keep in mind in writing an article, or we might even say, a book, is to avoid preparing it so that any one filing the data away for future reference would place it in filing division 9. Instead, select a subject covered, let us say, by division 0. This, at least, limits one to the description of telephone apparatus and does not naturally conflict with the line circuit class, the central office or the power equipment, nor need it conflict with divisions 5, 6 or 8.

Therefore, when one writes an article which belongs in class 0, he still may write on the subjects covered by divisions 1, 2, 3, 5, 6 and 8, without any possibility of there being any conflicting or duplicating statements between the 0 article and any of the subjects just mentioned. However, the inexperienced writer finds that he soon outwrites himself. That is to say, he comes to a point where he must repeat something he said before when he prepares an article on the subject covered by one of the divisions, 0, for example. Therefore, it becomes necessary still further to subdivide the classes so that the possibility of repetition may be precluded.

Referring to Figure 2, we have the 0 division with six divisions in triangular form to the right. These divisions are lettered respectively *A, B, C, D, E.* and *F,* and represent subdivisions of the subscriber's station equipment. *A* represents a statistical division under which all questions pertaining to statistics may be discussed, patents, and the present state of the art records belonging in that class. *B* represents an analytical class under which such questions as specifications, manufacturing, operating, testing and miscellaneous applications may be placed. In fact, the analytical class covers all subjects which apply to actual, practical work, but anything in the line of statistics must be left under the *A* subdivision. The third subdivision, *C,* covers an educational class, and under this subjects pertaining to instructions, observations, investigations, historical literature, legal questions, theory and electrical effects may be placed.

In constructing these three subdivisions, it is not difficult to assign an article to the educational class, nor is it difficult to properly assign an article in the statistical class. However, the method which has been followed with success in assigning an article to its proper class consists in determining whether the article is of an educational character. If not, it must be either of the statistical or analytical kind. Now, if one will remember that the analytical class covers nothing but subjects which are alive and being worked with for producing material results, it is not difficult to assign the statistical class to its proper division. Of course, as was also the case in the division shown by Figure 1, we must expect to find a combination of these divisions. Thus, combining *A* and *B* as shown by Figure 2, we produce the *D* class, and in this class—for the moment imagining that we have a filing cabinet arranged accordingly—is placed all matter pertaining to statistics as combined with analytical subjects. Under *E* we have a combination of the educational and analytical classes, and finally, under *F,* we have a division combining the statistical, analytical and educational subjects. In a general way, subdivision *F* is quite similar to subdivision 9 in Figure 1, and it is the class which the writer must avoid when treating the subject in detail. From the foregoing the reader will observe that subdivisions *A, B* and *C* may each be divided into many subjects, a few having been mentioned above.

Figure 3 shows a combination of Figures 1 and 2, and with such a diagram before him and with the *A, B* and *C* classes properly subdivided, the writer of technical articles has at hand a means which, when intelligently applied, will provide him with subjects for treatment for years to come. It will be observed that not only under the 0 class have we the subdivisions *A, B* and *C,* but we have the same divisions under every class throughout the main subdivision. In order that the reader may gain some idea as to the minimum number of articles which may be written on the subject of telephony, let us assume that under statistical we have five divisions. The chances are there will be more. Further, that under analytical we have ten divisions, and under educational, an additional ten. This gives us twenty-five divisions, and it practically means that twenty-five absolutely separate and distinct articles can be prepared on each one of the ten master divisions. This gives us at least 250 articles for our immediate consideration, and if we add to this the number of articles which may be written under each one of the subdivisions, say *B,* by simply treating a certain type of instrument, this number of articles can easily be multiplied by ten, giving us, therefore, at least twenty-five hundred articles which a well posted writer on telephone subjects might prepare, and each one of the articles, if prepared with due consideration to the limitations of the subdivisions, will contain data of interest, and not in any way conflict with articles previously written by the same author. So much for the selection of a subject by an author when about to prepare one for publication.

Now, as respects illustrations, the tendency of an author, when submitting an article to the editor of a paper, is to use illustrations which are readily obtainable, and frequently such illustrations as are selected have already been used in some other publication. This practice of using illustrations not original in an article, which is supposed to be original, is one which should not be followed by an author. Everything in an article should be original, and it is the illustrations which have appeared in other publications, and which again appear in a supposed original article, that tend to reduce the value of such article.

In the preparation of these suggestions it is the writer's purpose to bring out as strongly as possible the great advantage of originality in writing an article, and in presenting Figure 3 he believes a method has been proposed which will be of material assistance to many in the selection of an original subject, and, when combined with a carefully selected number of illustrations, any one who thoroughly undestands the subject which he attempts to treat should be able to prepare an article of an exceedingly interesting character and of value to everyone who may read it.

As to the length of an article, the subject, of course, determines the number of words one must use in clearly covering it, but there is one hard and fast rule which every new author should bear in mind, namely, the fewer words one uses in clearly describing a certain function of a piece of apparatus the better the article will be liked. And one other point: Few authors are able so to treat a subject that the article will be of any great benefit to those above them in experience and learning. Articles directed to those below us may be of too academic a character, but when an article is written in such a manner that even the author himself knows more about the subject—after studying the question—than he did before he prepared the article, that is the treatise which will be widely read and give information alike to those above, below and equal to him in technical learning.

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### *WHEN YOUR PHONE IS OUT OF ORDER.*

When your phone is out of order, and the only voice you know is your own, which wildly bellows in the box a fierce "Hello," you can understand the feelings of the murderer and see many mitigating things that might have happened easily. Oh, you hop around in frenzy till you're goggle-eyed and faint, when your phone is out of order, but your voice and feelings ain't.

# MANSON'S PRACTICAL SUGGESTIONS

*A Series of Short Articles Dealing with Important Phases of Telephone Work*

By Ray H. Manson

IN a previous chapter the construction and handling of switchboard cables are described and illustrated. The placing of this cable in the runways between switchboard and frames, as well as the fastening of the cables to the frames themselves also must be done carefully in order to produce a neat and satisfactory installation. It is apparently a simple matter to perform the various necessary operations, but to the uninitiated the small and unimportant details are the customary stumbling blocks.

There are many different ways to accomplish practically the same results in switchboard cabling, each with its particular exponent, but the underlying principles are about the same so that a few examples will suffice.

In the larger switchboard installation metal frame works are provided into which, or onto which the cables are fastened, these frameworks extending between the switchboards proper and the distributing boards and relay racks. This construction is now followed, even to the runways inside of

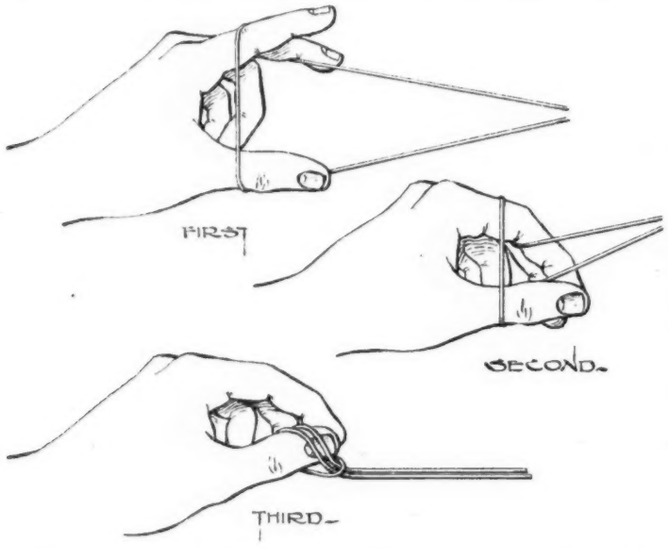


Figure 55—A quick method of forming a noose used in switchboard cabling.

the switchboard cabinets when there are a sufficient number of cables to warrant a special support.

The majority of the metal cable runways or supports are made from strap iron securely braced and provided with a sufficient number of cross pieces to support the cables without the latter sagging. These cross pieces also serve as convenient places to which the cables are securely laced so as to give a permanent installation. Metal cable supports of more elaborate design make use of channel or angle iron for the side supports and round rod for the cross pieces on which the cables rest and to which the lacing is attached.

It is obvious that the shape and design of these cable racks vary with the installation as the location of the various parts of the exchange equipment are made to fit the available space in the exchange building to best advantage.

When cables are placed on a wooden support, cross pieces of wood one or more inches square and as long as the total width of the cable runway are placed in close proximity so as to leave a clear air space beneath the cables. This is necessary to prevent dampness from entering the cables.

It is desirable in placing cable between the switchboards or exchange apparatus that the several cables of a run, either be laced together as a whole and to the runway frame work, or that the cables be laced together in layers. This latter arrangement is necessary in the case of a multiple run at the rear of the multiple jacks in the switchboard cabinet, as it often becomes necessary to get at the termi-

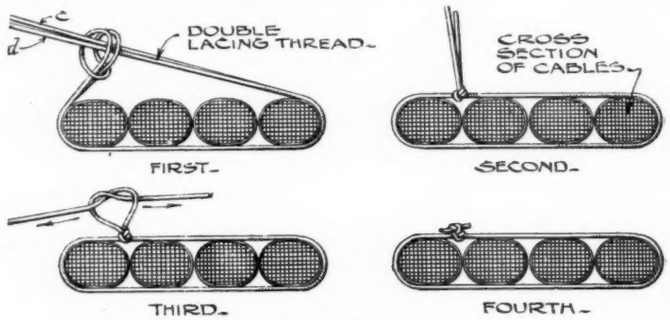


Figure 56—A cable binding loop used as a temporary or permanent fastening for a layer of switchboard cables.

nals of some of the jacks or to remove entirely a strip of jacks. The layer arrangement allows the cables to be separated and wedged apart so as to give access to the particular jacks desired.

When there are few cables in a run the lacing of these cables to the frame work of the runway and distributing boards can be accomplished without resorting to complicated methods. However, it is sometimes necessary to make use of special cable clamps or ordinary cabinet-maker clamps as shown in Figure 63 to hold the cables in place

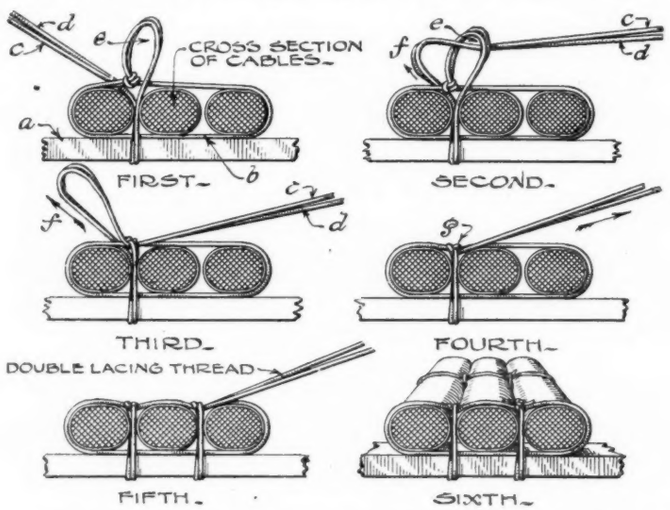


Figure 57—Operations of lacing together one layer of switchboard cables. This same method is used when the cross bar "a" is absent.

at the turning points of the cable runs until the binding and fastening of the same to the runs has been completed.

*A Cable Binding Loop:*—When there are several layers of cable in a run and each layer is to be held in shape until the entire lot of cables is in place, a loop shown in Figures 55 and 56 can be used to advantage. A piece of waxed Boston lock stitch machine thread (six cord

size) is taken of the proper length to encircle the layer of cables in a double strand. A slip noose is formed in the midde of this piece of thread by first doubling it back on itself. This noose can be quickly made by holding the thread as illustrated in the first view of Figure 55, and then allowing the loop to slip off the ends of the fingers over the thumb as shown in the second and third views of the same figure.

The free ends of the thread are now passed around the layers of the cable and inserted through the part of the noose occupied by the thumb as illustrated in the first view of Figure 56. The noose is then drawn tight so as to have the knot come between the first and second cables as shown in the second view, after which a single tie is made and the surplus ends are cut off as shown in the third and fourth views of Figure 56. This single tie is sufficient to hold the loop securely, an otherwise difficult feat due to the waxed nature of the thread.

If these layers are to remain as a permanent job, it is advisable to shellac the thread, thereby sticking the parts together and giving a neater finish to the work.

*Lacing Together One Layer of Cable:*—When a run contains a few cables only the latter can be arranged in a layer and bound together at a sufficient number of points to insure a permanent job by using the following method:

After the cables are in place and laid perfectly smooth, and held with clamps, if necessary, the bindings are put on commencing at the attached or fixed ends of the cables, by first making a loop as shown in Figure 56, but not drawing it tight, as the subsequent cross stitches between the sev-

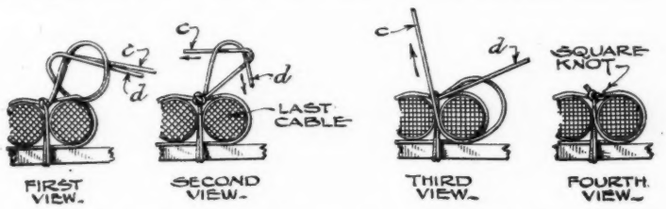


Figure 58—Final fastenings for the lacing cord used in binding switchboard cable together. The first and second views show a lock stitch and single knot method, while the third and fourth views show a fastening around the last cable with a square knot.

eral cables will accomplish this purpose. The amount of slack in the loop can be determined best by experiment. If a uniform job is desired through the entire run, a small wooden wedge of sufficient size to allow for this looseness can be made and laid alongside the cable when tying the loops. However, if a wedge is used it should be removed before any of the succeeding operations are done.

After the loop is tied loosely around the cable, the free ends *c* and *d* of the twine are passed together between the first two cables, around the cross piece *a* of the cable rack, first view of Figure 57, and back between the same two cables. If there is no cross piece located at the binding point, the twine can be passed around the strings *b* of the loop.

The ends *c* and *d* of the thread are now passed through the loop *e*, second view of Figure 57, left when performing the first operation and this loop drawn tight by pulling on the strings as indicated at *f*, the result being shown in the third view. Now by pulling on the free ends of the threads a secure knot, known as the lock stitch, will be completed, as illustrated at *g* in the fourth view of Figure 57. If made correctly, this knot will prevent the work already accomplished from slipping.

The threads now are passed over the next cable and between the second and third cables and terminated in a lock stitch, the latter operation being the same as in the case of the stitch between the first and second cables. If there are more than three cables, these stitches are repeated between each of the succeeding cables, the last stitch being shown in the fifth view of Figure 57.

The job of binding is completed by securely fastening the threads by one of the succeeding methods, after which the ends are cut off, giving the result shown in the sixth view of Figure 57.

*The Final Fastening in a Cable Binding:*—A secure fastening for the ends of the thread used in binding can be made in several ways. The first and second views of Figure 58 show a simple knot done by passing the two threads *c* and *d* together under the binding loop and then taking a lock stitch after which the threads are separated and a single knot tied.

The third and fourth views of Figure 58 illustrate a second method of making a final tie. Here the threads

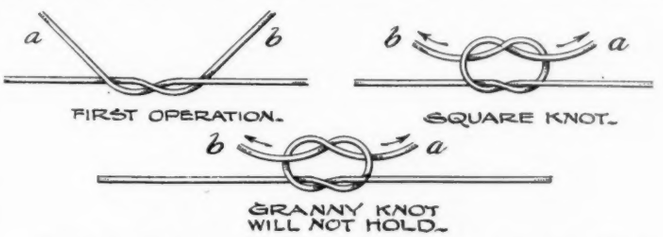


Figure 59—The correct way to make a single knot, also the so-called granny knot which is an insecure fastening.

are first separated, one of them, *c*, passed around the last cable and the two ends tied securely together by a square knot. The anchoring of the twine thus is made around a cable and very little strain is left for the knot.

As previously stated, the use of waxed twine requires extra care in the tying of knots so as to prevent slipping. Therefore, the so-called "granny" knot which is very often used in place of a square knot must be strictly avoided if the job is to remain permanent. Figure 59 shows the two operations in tying a square knot, also the "granny" knot which is made the same as the former but with the second operation reversed.

*A Simplified Method of Lacing Together One Layer of Cable:*—Figure 60 illustrated a method of binding together cables similar to that just described, omitting the lock stitch between the cables, so as to simplify the operations. The ends of the twine are fastened as shown in the third and fourth views of Figure 58. Rigidity and security are sacri-

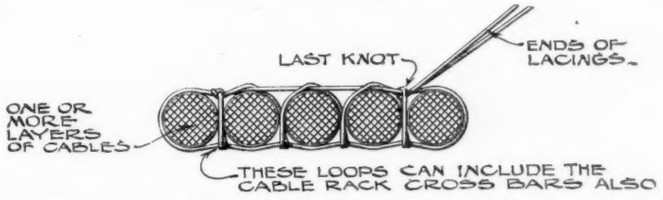


Figure 60—Simplified method of lacing cables together. This is not as secure as the method shown in Fig. 57.

ficed for a slight saving in time over that required by the lock stitch.

*Tools for Sewing Cables in Runways:*—It is necessary to make use of some form of a needle or sewing tool to draw the threads, used in binding the cables together, between the various cables and layers of cables. Figure 61 illustrates several simple tools adapted for this work.

An ordinary button hook *a*, Figure 61, filed or ground thin, if necessary, and smoothed with emery cloth so as to take off the rough edges, is used to good advantage in cable sewing. This tool is used by inserting the hooked end between the cables so as to engage the threads, after which the latter can be readily drawn through.

A convenient needle for use where flexibility is desired or when the threads are to be drawn between a large number of cables, is made in the form illustrated in Figure

61-B. These needles can be made from thin sheet fiber with a perforation, *a*, for holding the threads, or from sheet metal with a round hole at one end, or with a lip, *b*, over which the thread can be hooked. In the latter case the lip should be in the same plane as the remainder of the needle, as otherwise it will engage in the cable braiding when it is drawn through. Sheet steel, tempered after the needle is made, is the metal best suited for this construction. It is essential that all sharp corners and edges are removed carefully from the flat type of needle to prevent injuring the cable sheath.

A piece of hack saw blade with the teeth ground off and the ends finished smooth makes a handy needle for cable sewing and is easily procured.

For some kinds of cable sewing a four-inch packers' needle shown at *c* in Figure 61 is convenient. The end

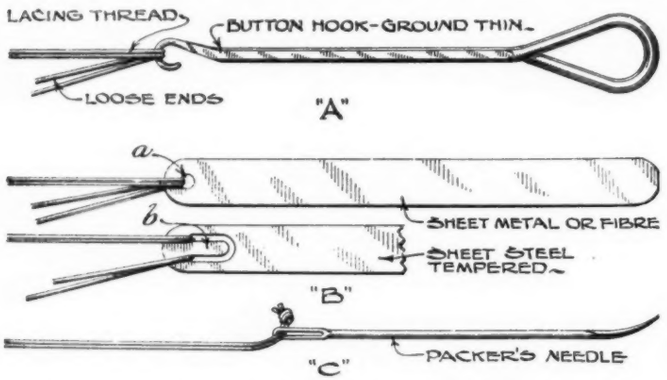


Figure 61—Tools used in sewing switchboard cables together.

of this needle is slightly bowed out of line with its shank, thereby allowing it to be readily inserted under a tight lace or between two cables. The lacing thread is inserted through the needle eye and the ends left sufficiently long to prevent their pulling out when the needle is drawn between the cables, or if the ends are short they are tied as shown in the illustration.

*Binding Together Several Layers of Switchboard Cables:* When a number of cables in a complete run are sufficient for several layers and the nature of the work demands this arrangement, it is advisable to bind and cross sew the

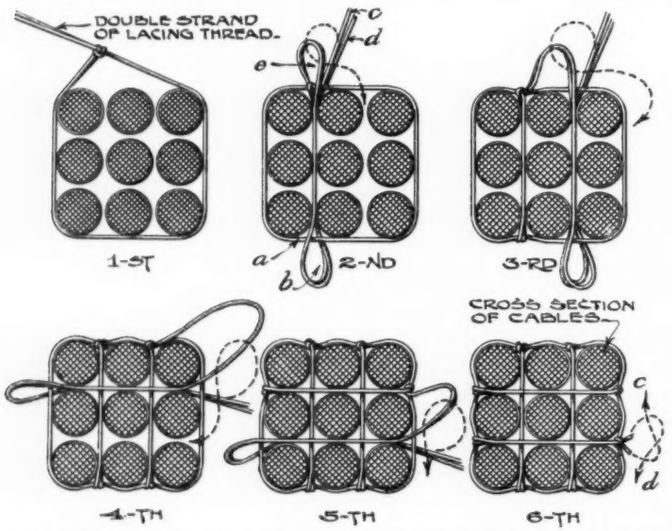


Figure 62—Binding together several layers of cables, making use of cross stitches.

whole together at frequent points in order to give permanency and neatness to the job. Figures 62 and 63 illustrate a very good method to follow in doing this work, the cross stitches being similar to those shown in Figure 57.

The binding is commenced by taking a double strand of lock stitch thread, passing it around the cable and forming a noose illustrated in the first view of Figure 56. This noose is left with some slack (first view of Figure 62) to allow for the spreading of the cables due to the cross sewing. The necessary slack, after once being determined by

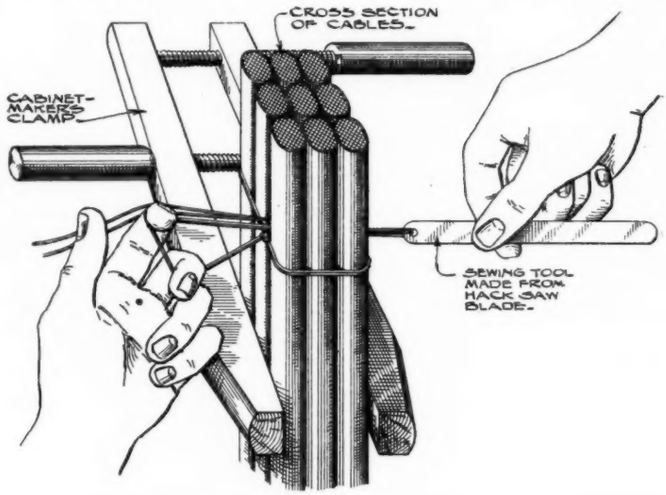


Figure 63—Operation of binding several layers of cables together.

experiment, can be made uniform for all succeeding bindings around the same group of cables by using a space block as previously described in connection with "Lacing together one layer of cable."

The second view of Figure 62 shows one cross stitch between two layers of cables, this stitch including the binding threads at *a*, or if a cross piece of a cable rack is located at the points of binding the loop *b* should also include the same so as to securely fasten the cable to the runway. The double ends of the threads *c* and *d* are

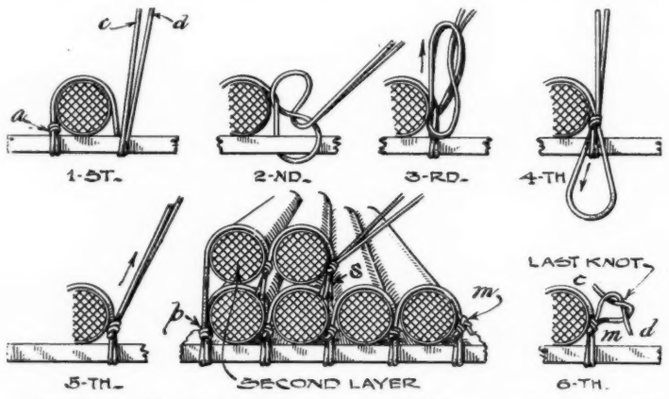


Figure 64—Method of binding cables together in which each cable is tied in place as soon as it is laid in the runway.

now passed through the loop *e* and drawn tight so as to make a lock stitch and retain the work already accomplished.

The succeeding stitches between parallel layers of cables are taken in exactly the same way as that just described and as illustrated in the third view of Figure 62.

The cross stitches between layers at right angles to the first set of stitches are commenced as shown in the fourth view of Figure 62, the operation for each stitch being the same as previously described. The last stitch is terminated in a lock stitch, fifth view of Figure 62, and held from loosening by separating the two ends *c* and *d* of the lacing thread and tying a single knot as shown in the sixth view of the same illustration.

At bends in the cable run or where the cables are ar-

ranged vertically, it is often necessary to make use of cable clamps or cabinet-makers' clamps to hold the shape of the group of cables until the bindings are completed. Figure 63 shows the use of one of the latter clamps, as well as the use of a special sewing tool made from a hack saw blade.

There are several simplified methods of accomplishing results similar to those just described but none as secure.

One deviation is the omitting of the cross stitches shown in the fourth and fifth views of Figure 62, while still another method is the omitting of the lock stitch made at the completion of each cross stitch as in Figure 62, substituting a simple crossing over of the threads shown in the case of a single layer of cable, Figure 60. This crossing over of the thread can be either at the top or bottom of the cables. If the latter method is used and the cross stitches are made around a cross bar of the cable rack, the exposed threads will show at an angle on the under side of these bars. In such a case, if the under side of the cable rack is exposed to view, it would be preferable to make the cross-overs at the tops of the cables, thereby giving a much neater effect.

*Binding Switchboard Cables in Place One at a Time:* Special methods of fastening cables, when the latter are run one at a time, such as in the case of answering jack cables of multiple switchboard, are used by some installers. In order to do such an operation, it is necessary that cross bars be provided at each point of binding, or in the absence of a sufficient number of cross bars, hard wood strips cut to the proper dimensions can be substituted.

Each cable is bound in place by using a double thread, one end of which is fastened to the cross piece by a slip noose, as illustrated at *a* in the first view of Figure 64. After passing over the cable the threads are again fastened to the cross bar as shown in the second to fifth views inclusive of Figure 64. This fastening consists of a knot similar in effect to a lock stitch, its efficiency depending entirely on the proper drawing of the threads tight as per the illustration.

Each succeeding cable of a layer is fastened in a similar

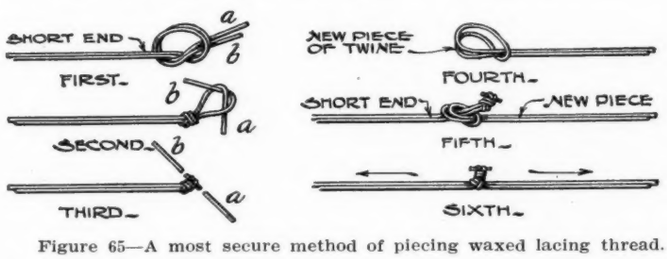


Figure 65—A most secure method of piecing waxed lacing thread.

manner, and the last knot, *m*, sixth view of Figure 64. held from any possible chance of slipping by separating the two threads *c* and *d* and tying them in a single knot. Additional layers of cable are treated in the same manner by first tying the lacing thread to the cross piece, as a *p*, Figure 64. and binding the cables to the layers immediately beneath. Each stitch or binding, however, is made to the binding thread of the cable under each new cable as at *s*. A packers' needle, Figure 61-C, can be used to advantage in making these stitches.

Unless the preceding work is done carefully the cables are liable to become loose or separated more than in the other methods of binding.

*Piecing-Out of Waxed Lacing Threads:*—Of all the many knots for tying two pieces of thread together, possibly none is better adapted to the waxed nature of Boston lock-stitch machine thread as the scheme extensively used by switchboard installers and shown in Figure 65.

When it becomes necessary to piece out the lacing threads a knot is tied in their ends, as shown in the first, second and third views of Figure 65. The new piece of thread is doubled and a noose formed as shown in Figure 55, the latter being passed over the knotted end of the short thread and drawn up as illustrated in the fifth, and sixth views of the former figure. It is needless to say that this gives a most secure fastening.

*A Cord Tie Used in Drawing Cables Through a Runway:* When cables are to be drawn through runways a simple tie for the cord can be made as illustrated in Figure 66. A noose is taken around the cable, after which several hitches are made, the latter having the property of tightening when the cord is pulled, but being readily removed by slipping back from the end of the cable when the strain is taken from the cord. This tie is readily made, easily removed and holds securely when in service. It must be noted that

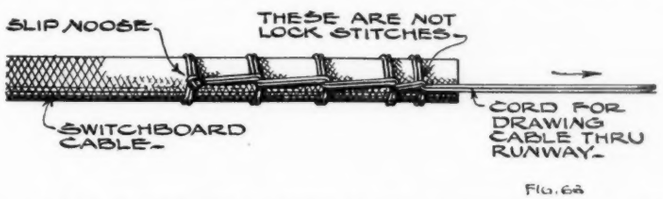


Figure 66—One way to attach a cord to switchboard cable for drawing the latter through a runway.

the several hitches around the cable are not lock stitches, but are rather made opposite so as not to lock in place except when the cord is pulled.

## *SEVENTH ILLINOIS DISTRICT.*

The members of the Seventh District of the Illinois State Independent Telephone Association held their annual meeting at Springfield, February 7, which proved to be a most successful gathering. The companies represented furnish telephone service to more than 30,000 subscribers. The Illinois state convention will be held in May, and the Seventh District members formed plans to bring the meeting to Springfield so it will be within the boundaries of the district.

W. H. Ramsey, of Alton, was elected district president, and F. W. Kelly, of Springfield, was re-elected secretary. The executive committee comprises L. C. Schwerdtfeger of Lincoln, C. S. Haskins of Decatur, J. H. Hackett of Jacksonville, E. D. Boynton of Pleasant Plains and W. D. McBride of Taylorville.

Addresses were made by B. F. Wasson of Clinton, who spoke on "Evolution of the Telephone," and C. B. Cheadle, of Joliet, state secretary, who discussed the growth of the Independent movement.

## *A LUCKY TELEPHONE GIRL.*

Six years ago Mrs. Charles Payne, of Lawton, Okla., was a telephone girl of Wichita, Kan. To-day she is counted one of the wealthiest women in the new state, and all because she was lucky enough to draw a valuable claim when the Kiowa-Comanche lands were opened for settlement in 1901. At that time she was Miss Mattie Beal. When the drawing was made there was a scramble to secure claim No. 1. Thousands of applicants strove to capture the first choice, but the telephone girl won. Her claim adjoined the Lawton townsite, and most of the 160 acres is now within the most valuable part of the prosperous city of Lawton. Miss Beal paid but $1.25 an acre for the tract. Subsequently she became Mrs. Charles Payne, and the other day she and her husband visited the claim and planned to erect a $30,000 residence on a portion of the land she obtained so cheaply in 1901. Mrs. Payne intends, of course, to have her fine home fully equipped with telephones.

# DECISIONS AFFECTING TELEPHONY

By Gilbert W. Hand

A TELEPHONE OPERATOR ASSUMES THE ORDINARY RISKS OF HER EMPLOYMENT—WHAT ARE EXTRAORDINARY RISKS?

THE first case discussing this question that has come to the writer's notice has recently been decided by the supreme court of Massachusetts. The facts were that a woman operator employed by the New England Telephone & Telegraph Company had brought suit for damages for injuries which she alleged were due to the negligence of the company in allowing an electric current to escape into the switchboard, at which she was working, and injuring her severely in consequence. The court said on the question of what risks from electricity an operator assumes: "On entering the employment of a telephone company an operator at its exchange assumes the ordinary risks of irritation reasonably connected with the performance of her duties, but does not assume the risks of shocks from an electric current producing bodily prostration, though the degree of voltage is not sufficiently high to imperil life." There was evidence that the operator knew of peculiar clicking, buzzing noises above the switchboard and that she had notified the manager of them, and on this ground the company sought to escape liability, alleging that she must have known that there was something wrong and should not have continued to use the apparatus thereafter. The court said this was for the jury to decide considering all the circumstances of the case. The proof showed that the dangerous current had in fact injured the operator, but there was no showing by either party as to just why or how it escaped into the switchboard. The company claimed that it was the duty of the plaintiff to establish that the negligence was that of some one in authority, and not that of one of the plaintiff's fellow servants, since, if the latter, she could in no event recover damages, but the court held that, having established the fact that the current did in fact produce the injury, it was for the company to show affirmatively that the negligence of a fellow servant caused the accident.

*Cahill v. New England Telephone & Telegraph Company, 70 N. E. 821.*

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WIRE OVER LAND BUT UNSUPPORTED BY ANY STRUCTURE THEREON—WILL EJECTMENT LIE TO REMOVE THE WIRE?

The point here raised has not been discussed in TELEPHONY, and, owing to the importance of the ruling on this matter to companies generally, we quote below a considerable portion of the decision. The facts as found by the trial judge were that the Frontier Telephone Company, on or about January 1, 1903, without the consent of one Butler, stretched a certain wire over and across the latter's premises in the city of Buffalo and maintained such wire thereon until January 10, 1903, when the defendant company removed it. The complaint alleged that the wire was strung about thirty feet from the surface of the ground on the east side and slanting about twenty feet on the west side, reaching across the entire width of the premises. It was established that the plaintiff was in possession of the premises except that portion occupied by the defendant with its wire. On July 5, 1903, Butler brought suit in ejectment, for the "withholding by the defendant of that portion of the premises occupied by the wire for the purpose above specified." There was no showing that the wire was attached to any structure on Butler's lot. The parties went to trial on the issue whether the company was liable for damages in having occupied the space across the lot from the first to the fifth of the month mentioned. It was decided in the lower court that Butler was entitled to six cents damages and costs. The appeal to the appellate division affirmed this judgment by a divided vote, and the court of appeals of New York has finally had occasion to discuss the matter.

While the monetary question is insignificant the principle involved is of considerable importance. The court of appeals said in part: "The question presented by this appeal is whether ejectment will lie when soil is not touched, but part of the space a few feet above the soil is occupied by a telephone wire unlawfully strung across the plaintiff's premises. This question has never been passed upon by the court of appeals or by the supreme court except in the decision now before us for review. Questions similar but not identical, as they relate to overhanging eaves and projecting cornices, were decided in favor of the defendant, in Aiken v. Benedict, 39 Barb, 400 . . . The precise question before us does not appear to have been passed upon in other states, and upon the questions relating to the projecting cornices and the like the authorities are divided. . . . In Wilworth v. Woodcock, 58 Mich., 482, it was decided that equity could require the removal of a projecting cornice because no remedy at law is adequate, owing to the uncertainty of damages to afford complete compensation, but, as the court continued, no person can be permitted to reach out and appropriate the property of another and secure for himself the adverse enjoyment and use thereof, which in a few years would ripen into absolute ownership by adverse possession. . . . Is the authorized stringing of wires by one person over the land of another, an ouster from possession? Was the plaintiff in the undisturbed possession of his land when a portion of space above it was occupied by a permanent structure of defendant? Was the space occupied by the wire part of the land in the eye of law? What is real estate? So far as the case before us is concerned, the plaintiff, as the owner of soil, owned upward an indefinite extent; he owned the space occupied by the wire, and had the right to the exclusive possession of that space. Space above land is real estate the same as the land itself, . . . an owner is entitled to the absolute and undisturbed possession of every part including the space above as much as a mine beneath." The following illustration was suggested by the court as emphasizing the real point: "If the wire had been a huge cable, several inches thick and but a foot above the ground, there would have been a difference in degree, but not in principle. Expand the wire into a beam supported by posts standing upon abutting lots without touching the surface of plaintiff's land, and the difference would still be one of degree only. Enlarge the beam into a bridge, and yet the space only would be occupied. Erect a house upon the bridge, and the air above the surface of the land would alone be disturbed. Where along the line of these illustrations would dispossession begin?" The judgment was therefore affirmed against the telephone company.

*Butler v. Frontier Telephone Company, 79 N. E. 716.*

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INJUNCTION TO RESTRAIN PLACING OF POLES ON ABUTTING HIGHWAY WITHOUT AUTHORITY.

Although the Illinois supreme court has heretofore declared the rule on this question for Illinois, a recent decision has discussed the points anew and affirmed the established rule. One Ann C. Burrell owned certain property in front

of which the American Telephone & Telegraph Company in 1896 erected certain lines of telephone. There was an attempted agreement at that time with reference to compensation to her for the right to pass in front of her property, but there was no definite understanding. After a period of years the company sought to make certain improvements to the crossarms and the poles, and was met with an injunction seeking to remove the line entirely from in front of the premises and temporarily restraining the progress of the work. At the trial the company established the fact that some thousands of messages passed over this line daily, that the removal would be a serious inconvenience and a great expense, and contended that inasmuch as the owner had delayed so long in bringing her injunction proceedings she had lost any right that she might have had at the beginning. The supreme court, in deciding the case, agreed upon the following statement of the law to be applied: "A telephone line in a public highway is an additional burden upon the fee, for which the owner of the fee is entitled to compensation. (Postal Telegraph Company v. Easton, 170 Ill. 513.) The maintenance of the telephone line and the addition of new crossarms, . . . constitute a continuing trespass, which equity has jurisdiction to prevent by injunction. . . . Defendant did not act in ignorance of the real title, or enter upon the highway believing that it had any title whatever, and it knew just as much about the facts of the case as the complainant. . . . Defendant is in no better position than any person who enters upon the land of another knowing that he has no right, and that nothing but the statute of limitations will prevent him being ejected therefrom. . . . The fact that a large number of telephone messages are sent over the line daily, and that therefore it would be inconvenient for the public to have the defendant line removed from in front of complainant's land, is of no importance whatever. If the land is needed for a public use, the law provides a way for acquiring it, and the constitution prohibits its appropriation for such a use without compensation. . . . Defendant cannot be heard to say that the public want it to have the use of the land without the company first paying for the same." It will be noted, in conclusion, that the point of the opinion affirms the previous holding of the supreme court that the use by a telephone company of abutting property for the erection of poles and the stringing of wires constitutes an additional burden for which the property owner may demand compensation; further, that in this state a company may exercise eminent domain to acquire such rights when the property owner and the company cannot agree on the price. In any case the abutting owner can legally demand compensation before allowing the use of his abutting highways for the purposes mentioned.

*Burrell v. American Telephone & Telegraph Company, 79 N. E. 705.*

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DESTRUCTION OF TELEPHONE LINES BY RAILWAY COMPANY.

The Batesville & Winerva Telephone Company brought suit in the circuit court of Izard county, Arkansas, for damages sustained by it by the act of the White River Railway Company in destroying some six hundred of the telephone company's poles, removed by the railway company while laying its roadbed. It was shown that the latter company had in fact surveyed for its line of railway, but had not filed a copy of its map in accordance with Kirby's Digest, Sec. 6569, which provides that before a railway company shall do any clearing, it shall file its map and profile in the office of the clerk of the circuit court. A verdict of $550 was given to the telephone company which has been affirmed by the supreme court of the state. The damage to the telephone company was done between the date of the survey and the filing of the map. The court said: "The making of a survey gave the railway company no rights in the land on which the telephone company's lines were located, even if the telephone was built after the survey. It was not shown when the railway company acquired its right of way and unless this was acquired prior to the construction of the telephone company's poles the railway company had no exclusive right on the ground."

*White River Railway Company v. Batesville & Winerva Telephone Company, 98 S. W. 721.*

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CARE REQUIRED IN THE USE OF ELECTRICITY—RULE IN FLORIDA.

In a personal damage case in Florida, which arose in consequence of the death of one Sloan from an electric current from the wires of the Jacksonville Electric Company, the supreme court had occasion to discuss the question of care required by those having occasion to handle electricity, and said in part, "Electricity is an invisible, impalpable force, and is highly dangerous to life and property, and those who make, sell, distribute or handle it are bound to exercise care proportionate to the danger involved." It will be noticed that this is a modification of the rule declared in some other states, to the effect that the care required is the highest degree of care, rather than that proportionate to danger involved. This somewhat close distinction is a very important one, and the obligation is lessened accordingly as due care, that proportionate to the danger, or the highest degree of care is considered.

*Jacksonville Electric Company v. Sloan, 42 Southern, 516.*

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DAMAGES FOR PLACING POLES ON LAND WITHOUT AUTHORITY —RULE IN GEORGIA.

The supreme court of Georgia has said in a recent case in which the Postal Telegraph-Cable Company was a party that if the company, over the objection and against the protest of plaintiff, entered upon his property and erected telegraph posts without authority of law, he would be entitled to at least nominal damages therefor, although no special damages were shown. It was also said that the right of eminent domain exists in this state for the purpose of condemning land for placing poles and wires thereon and as a mode of determining the damages. However, if without acting under the authority of condemnation proceedings a company proceeds to erect poles and wires, it is a mere trespasser.

*Postal Telegraph-Cable Company v. Kuhnen, 55 S. E. 967.*

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## *RAILROADS ADOPTING TELEPHONES.*

At a meeting held recently by officials of the Southern Pacific railroad it was decided to equip the system throughout with telephone service. Train orders and company business will eventually be transacted by telephone, instead of by telegraph, as heretofore.

Although the telephone system that is to be installed along the Southern Pacific lines will for awhile be supplementary to the regular telegraph system, eventually the telephone will supplant the telegraph all over the system. Other roads throughout the country have installed telephone service in conjunction with the telegraph lines, and in many instances the telephone has entirely supplanted the telegraph.

The Illinois Central railroad has a telephone system, which is gradually taking the place of the regular telegraph service of the company. The Philadelphia & Reading, in the east, now depends entirely upon the telephone, having long since abandoned the telegraph. Portions of the Pennsylvania system have been installed with telephones, and it is the understood policy of the company to eventually chain its entire system together with telephonic communication.

# MODERN TOLL SWITCHBOARD EQUIPMENT

*The Second of a Series of Articles Dealing with this Important Subject*

By J. E. Hilbish, J. B. Thiess and G. A. Joy

ARTICLE II.

*Non-Multiple Toll Boards.*—As the toll business grows and assumes such proportions that the single position at the local board is inadequate to handle the same, it is but natural that the engineer, in order to meet the new conditions, should advance into a much broader field—namely, the design of a separate unit to be used exclusively for toll work. The circuits used in handling calls in a non-multiple toll board are, in many instances, exactly like those used in the toll position at the local board; and, therefore, it is often very convenient, in an exchange where this advance just described has been made, to retain the toll position at the local board for handling the night toll service only. If this is done keys are provided at the toll board for switching the toll lines to the local board, thus permitting one night operator to handle the toll as well as the local business. There are several ways by which this switching may be accomplished. One of the best available methods is shown in Figure 5, in which the toll line proper terminates in the main springs of a key, the inner contacts of which are connected in series with the line to the toll board, while the line to the local board is connected in a similar manner to the outer springs. Thus the key is the means by which the toll line signal of any particular line can be switched at will from the toll to the local board and vice versa. Another ingenious method of performing the same operation, when the use of keys is too expensive or deemed inadvisable, is to insert a rubber dummy plug into the jack at the board where the signal is to be disconnected. If this method is used the lines terminating at both the toll and local boards are wired in multiple. The act of inserting the plug opens the series contacts in the jack which disconnects that drop from the line. While this method is not as positive or advisable as the first, it is a very cheap solution of the matter in hand.

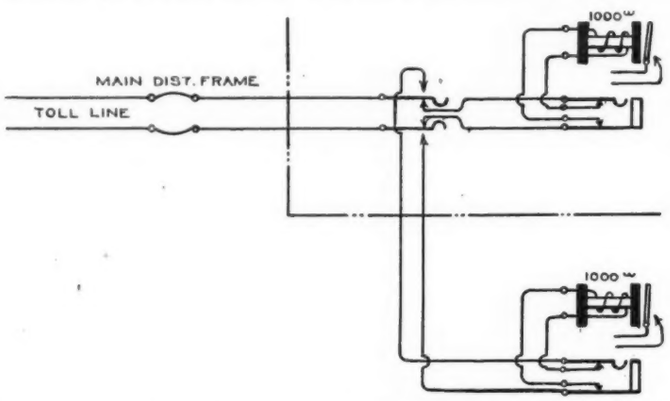


Figure 5—Toll Line Circuit Showing Switching Key for Night Service.

It is quite likely that in the mind of a person not familiar with toll operation the question would arise as to whether it would not be more advisable to equip a second toll position at the local board in preference to installing a separate toll board, if, as stated above, the method of operation is approximately the same. This question can be answered with many arguments in favor of a separate toll board, chief among which is the fact that the toll board is designed for the convenience of handling this class of business while the local board is designed for a very different purpose. Among the principal features to be observed in the design of a toll board, exclusive of the equipment, are wide key shelves, with plenty of space for the operator to do the necessary writing in making out tickets or other clerical work to which she may be assigned; book stalls for filing the necessary telephone directories that may be required in obtaining the telephone number of a party desired in a toll connection, and pigeon holes for the filing of toll tickets, etc.

In Figure 6 is shown a desirable arrangement of apparatus for a one-position toll board. It will be noted that the board embodies the heretofore mentioned features in regard to book stalls, pigeon holes and wide key shelves. It might also be advisable right here to give our reasons for distributing the electrical equipment as shown in the figure, since the relative placement of this apparatus is important, but is often thought of as hardly worthy of consideration. This problem is very readily solved for a small board similar to the one shown but as we proceed to a study of larger boards it will be observed that the question becomes a matter that demands serious attention. By referring to the figure we see that all the drops are located above the jacks,

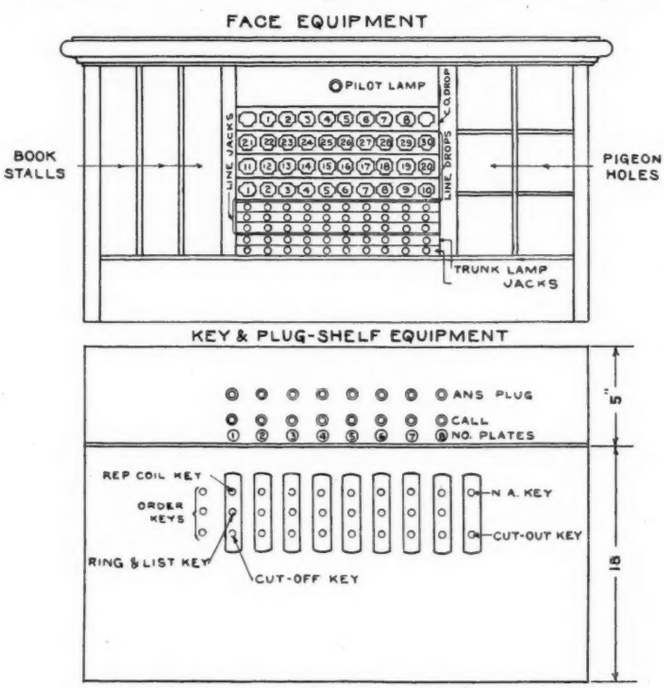


Figure 6—Arrangement of a One Position Toll Board.

in which position the operator will always have a clear and unobstructed view of the same. To show how the relative placement of the drops and jacks will affect operation, let us assume for example that some of the jacks are placed above them. Then if a number of connections have been put up, it will readily be seen that the cords used all pass directly in front of the drops, and therefore the operator may fail to see a shutter fall, or one of the cords is likely

to be crowded in toward the face of the board and thus prevent the shutter from falling altogether. It is also imperative that the line drops and jacks are numbered in a neat, clear manner, so that no time will be lost in locating corresponding drops and jacks. This is also true of the cord equipments, namely, each pair of cords and the accompanying clearing out drop should be numbered. The cords are best numbered by imbedding a number plate in the leather plug-shelf directly in front of each pair of cords, while the drops are numbered in the usual manner.

In arranging the keys to suit the convenience of the operator, we must bear in mind the fact that the key which will be most used should be placed nearest the operator and vice versa. As shown in the sketch, the repeating coil key is the one closest to the face of the board as it is operated but once, if at all, during a connection. Naturally, the one to place nearest the operator is the double cut-off key as she will be using this key almost continuously during the period in which she is completing a connection. The listening and ringing key is located between the other two, since its functions are such as to require its use less often than the double cut-off and more frequently than the repeating coil key.

Although the equipment shown in the diagram is for a board which is to work in connection with a magneto local board, the same general arrangement of apparatus would be used for one working in connection with a common battery board with the addition of a supervisory lamp for each cord circuit, which would be located in front of each pair of cords. In Figure 7 we have shown the arrangement of equipment for a two-position toll board, designed to operate in connection with a common battery local board. The same arrangement of apparatus will be noted, save that the trunking jacks are placed in the middle panel so as to be easily accessible to either operator. A calculagraph is placed in the key shelf between the two operators so that toll connections may be accurately timed.

Many switchboard managers are of the opinion that the buying of a calculagraph is an unnecessary expenditure of capital for a small board, but practice has shown that the instrument will more than pay for itself, because of the accuracy with which the operator can time calls without any material exertion on her part. It is now universally acknowledged by men who have been in close touch with large toll boards that the calculagraph is indispensable for their work; and if the same is a profitable investment here, logical reasoning will show that like results can be obtained with it at a small board, since a failure to charge up accurately the total length of time of a toll call affects large and small exchanges alike, and the amount of money invested to obviate this fault is identical in both cases. One of the many reasons that calls cannot be well timed by means of the ordinary clock is due to the fact that the operator cannot possibly make a positive guess at fractions of a minute, and therefore to avoid complaints she will give the subscriber the benefit of the doubt.

*Magneto Non-Multiple Switchboards.*—The equipment and type of circuits for non-multiple toll boards is dependent to a great extent upon the type of local switchboard with which it is to operate. In case the local switchboard be of the magneto non-multiple type then the operation is identical with that already described for a toll position at the local board, using the circuits shown in Figure 1.

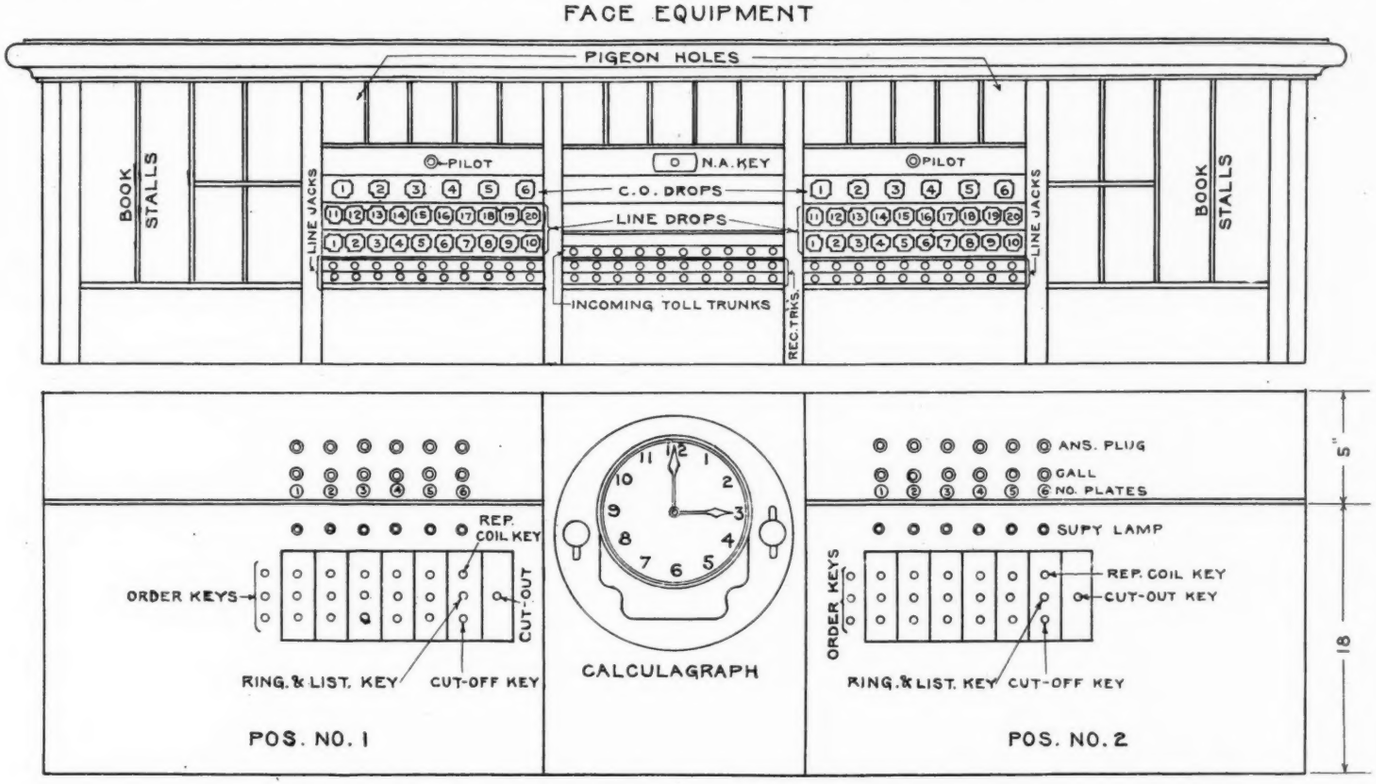


Figure 7—Arrangement of a Two Position Toll Board.

*Magneto Multiple Board.*—The operation of a toll board in connection with a magneto multiple local board is very similar to that of the magneto non-multiple, the only difference being in the trunking circuit. The plug at the local board end of this circuit must be provided with a sleeve conductor which will raise the potential of the sleeve of the jack into which it may be inserted, thus causing all the jacks on said line to test "busy." The trunk circuit for this purpose will be the same as the one shown in Figure 3, with the exception that the jack at the toll board will be of the two-conductor type. Hence, in order to operate the relay a pair of springs are provided in the jack, which, upon the insertion of the toll plug, make contact, thus completing a circuit through the relay. In order to obtain a clear con-

ception of the operation of this system, we deem it advisable to trace a call through a complete cycle.

When a toll party desires a connection with a local subscriber he rings up in the usual manner and the operator, upon ascertaining the number of the subscriber desired, will insert the calling plug of the pair of cords into one of the trunk jacks, thus energizing the relay and lighting the lamp at the toll as well as the local board. At the same time she will, by means of her order circuit, instruct the local operator at whose position the trunk line terminates as to the number of the local subscriber desired; whereupon the local operator will insert the plug associated with the lighted lamp into the multiple jack of the line called for, which act completes a circuit through the second winding of the differential relay, causing the armature to fall back, thereby extinguishing the trunk lamps. The toll operator will then operate her listening key, and in case she finds the line idle she will ring the party in the usual manner. If, however, she finds that the line is busy she can either operate her cut-off key, thus preventing the toll party from listening to the conversation and wait for the local party to "ring off," or she can break in on the conversation, telling the subscriber of the toll connection waiting for him and ask that the local conversation be deferred for the time being, so that the toll connection may be completed. When the conversation is finished both the toll and local subscribers "ring off," thereby throwing the clearing out drop. The toll operator will then take down her connections, thus opening the circuit of one of the differential relay windings, which will cause the armature of said relay to be attracted. This will light the lamps associated with the trunk circuit in use, giving the local operator a disconnect signal and she will then also remove her connection which restores the apparatus to its normal condition. Should the call originate at the local board, the operator, upon ascertaining that a toll connection is desired, will withdraw the plug of her regular cord circuit and insert the plug of one of her trunk circuits. This act will light the lamp associated with said circuit in front of the toll operator, who in turn will insert the answering plug of a pair of cords and thence complete the connection in the usual manner.

*Common Battery Non-Multiple Boards.*—The operation of a toll board in connection with a common battery non-multiple board is identical with that previously described for a toll position located at a non-multiple switchboard. The circuits used are those shown in Figure 3.

*Common Battery Multiple Board.*—We are now about to describe the last type of non-multiple toll board, namely, the one that is to operate in conjunction with a common battery multiple board. The circuits used in this board and those to follow are somewhat more complicated than those previously described, and we will therefore give a more complete description of their operation.

Although the toll line equipment remains the same, the necessary methods for trunking to and from the local board are more complex for the system about to be discussed, and consequently we will devote the major part of the description of this particular equipment to a detailed analysis of their operation. There are two general methods of handling connections between the toll and local boards. These are, first, by means of a two-way trunk, which may be used, as the name implies, for putting up a connection from the toll to the local board and vice versa; and, second, by means of recording and incoming toll trunks. The first mentioned trunking system is very well adapted to an exchange where there are ten or fewer equipped positions at the local board. The reasons for which will be readily appreciated by the reader after completing the following description. The circuit for such a system is shown in Figure 8 and we refer to this in tracing out the following connection.

A toll party, having reached the exchange in the usual way, will ask for the local party desired, whereupon the toll operator will place herself in communication with the local board by means of her order circuit, and instruct the operator as to the number called for. The local operator will then assign the trunk to be used and insert the plug of the trunk thus designated into the multiple jack of the sub-

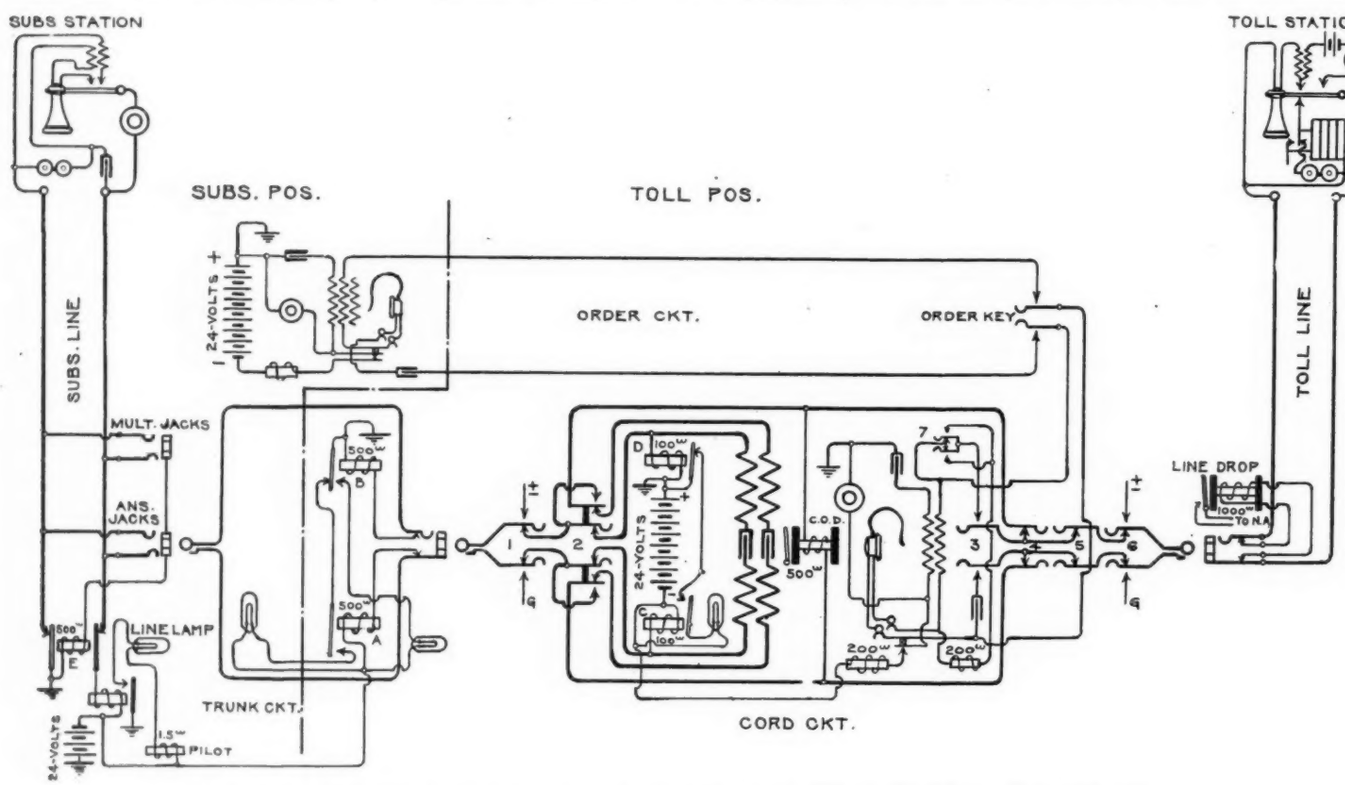


Figure 8—Toll Connection Over a Two Way Service Trunk to Common Battery Exchange Subscriber.

scriber's line wanted. The ring contacts of the plugs used in these circuits are so designed that they short circuit the ring and sleeve springs of the jacks into which they are placed. For this reason when the operation has proceeded as far as indicated above, and the local line is idle, we can trace a circuit from ground by way of relay *E* to the sleeve of the jack over the ring strand of the trunk through the series contact in the jack and consequently relay *A* to battery. Therefore, these relays will be energized thereby attracting their armatures which will light the lamp associated with the local board end of the trunk in case the toll operator has not previously plugged into the trunk jack. The act of plugging into the jack, will open the series contacts in the same, which will de-energize relay *A* and ex-

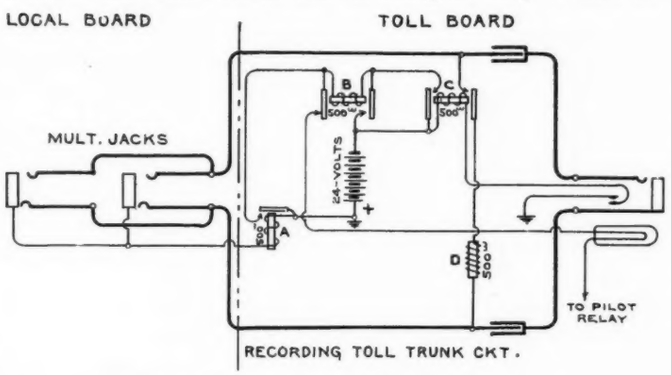


Figure 9—Toll to Local Service Trunk Circuit.

tinguish the light. At the same time a circuit will be established from the ground on the sleeve of the jack, over the ring strand of the trunk and toll board, through the contacts of keys 1 and 2, and the relay *C* to battery, thereby energizing this relay, causing the attraction of its armature which will close the local circuit thus lighting the supervisory lamp associated with this cord. When the local party removes the receiver, he bridges his telephone set across the line, which will cause the battery to feed out through the coils of relays *C* and *D*. The energizing of relay *D* will open the local lamp circuit and extinguish the supervisory light, informing the toll operator that the local subscriber has answered. In case the local line called for is busy, the supervisory lamp associated with the toll operator's cord will not light, since the line is bridged with the local party's telephone. which will energize relays *C* and *D*, thereby opening the local lamp circuit as explained above. In this case the operator may either actuate her cut-off key, thus preventing the toll operator from listening to the conversation, and wait for the subscriber to hang up, which act will light her supervisory lamp, and she will then call him in the regular manner; or, if the toll line is a busy one, she may break in on the conversation and tell the party wanted that a long distance call is waiting, and request that the local conversation be deferred until later. When the conversation has been completed, the toll party will "ring off," which act will cause the shutter of the clearing out drop to fall, and the local subscriber will "hang up" thus de-energizing relay *D* and lighting the supervisory lamp. The toll operator, upon seeing these disconnect signals, will take down her cords, which will close the series contacts in the trunk jack, thus energizing relay *A*. Consequently the lamp associated with the trunk at the local board will light, giving this operator a disconnect signal and she will remove her connections and so restore the equipment to its normal state.

In case the call originates at the local exchange, that is, a local subscriber desires a toll connection, he will call up in the regular way, and the operator upon ascertaining that a toll connection is desired, will remove the answering plug and insert in its place one of the two-way toll trunk plugs. This will cause the lamp associated with this trunk at the toll board to light, due to the operation of relay *A*. The toll operator will then insert the local plug of a pair of cords, which act extinguishes the lamp, and she will then handle the call in the usual manner. If, however, the toll line desired is busy, or it requires some time to complete the connection, she will tell the local subscriber to "hang up" and she will, upon reaching the toll party, complete the connection as already described, for a call originating with a toll subscriber.

In the use of the above described trunking system it is apparent that each local operator must have at least one two-way trunk at her command. A very desirable distribution of this type of trunk equipment is to place a group of two or three between each two local operators, in which position either operator may utilize them. From this it will be readily realized that when a local board has more than ten equipped positions, the number of trunks that are necessary becomes so large that the cost of installation becomes excessive, and consequently this method must be abandoned. This difficulty may be obviated by placing all the trunks at one position, in which case a local operator, upon receiving a call for a toll connection, will by means of her order circuit instruct the trunk operator as to the number of the party desiring toll service. The trunk operator will then insert one of her trunk plugs into the multiple jack of the calling party, and the local operator at whose position the call originated will withdraw her answering plug. The call will now be handled in the manner just described.

This arrangement of the trunking equipment will do very nicely when the amount of toll traffic is small, but when this business has assumed some size, it becomes necessary to handle it in a more rapid and clear cut manner. Since by the method just outlined a toll call is handled by two local operators before reaching the toll board, it is readily realized that this will give rise to an unnecessary loss of time, which will be saved to a certain extent by the system employing recording and incoming toll trunks. In Figure 9 we have

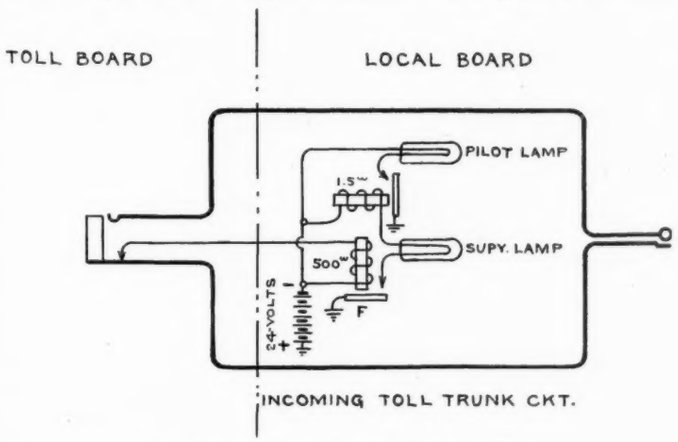


Figure 10—Recording Trunk Circuit.

depicted a desirable form of incoming toll trunk circuit. The local board end of these circuits is usually handled by the first subscriber's operator, as there would not be enough of them needed in connection with a non-multiple toll board to keep an operator busy. The operation of this circuit is as follows, it being understood, of course, that this circuit merely takes the place of the two-way trunk circuit shown in Figure 8, to which figure we refer in connection with Figure 9 in this description.

The toll operator will answer a long-distance subscriber, who has signaled the exchange in the regular manner, by inserting the toll plug of a pair of cords into the jack of the line calling and subsequently operating her listening key. Upon being informed that a local party is desired, she will

speak by means of her order circuit to the operator at the local board who handles the toll trunks, informing her as to the number desired, when the trunk operator will assign the trunk to be used. Upon receiving this assignment the toll operator will insert the plug of the local end of the pair of cords used into the jack of said trunk, which act will open the series contacts in this jack and thus disconnect all the trunk signaling apparatus from the line. Then, if upon listening in, she finds the line idle she will ring the subscriber. When the conversation has been completed the toll operator will receive the disconnect signals in a manner similar to that already described for this cord circuit. Consequently she will remove her cords, thereby closing the series contact in the trunk jack. This will light the lamp at the local end of the trunk, this circuit being traced from ground by way of relay *E* to the sleeve of the jack, over the ring strand of the trunk, and thence through the jack contact and relay *F* to battery. Thus relay *F* will be energized, attracting its armature which will close the local lamp circuit. The local operator upon receiving this disconnect signal will remove her cord, which will open the circuit and restore all equipment to its normal condition.

Should a local subscriber desire a toll connection, he calls up in the regular manner, and the operator, upon learning that a long-distance call is desired, will insert the calling plug of the pair of cords used into one of the recording toll trunk multiple jacks, which she has previously tested and found idle. This will complete a circuit from battery through the ring relay in the cord circuit and relay *A* in the sleeve strand of the recording trunk circuit, shown in Figure 10. Consequently these relays are energized and will attract their armatures, which will complete a local connection in the cord circuit, causing the lamp to light as already explained, while in the recording trunk we can trace a circuit from ground through the make contact of relay *A* to the back contact of relay *B*, and hence through the lamp to battery, thus causing this lamp to light. The toll operator upon seeing the signal will insert the plug of one of her cord circuits into the recording trunk jack associated with the lighted lamp. This act closes the contact in the jack, completing a circuit to battery through relay *C* which will energize the same. The operation of this relay completes two circuits, the first of which bridges the retardation coil *D* across the line, thus causing the tip relay in the local cord circuit to become energized, which extinguishes the supervisory light as described before; and the second completes a circuit from battery through relay *B* and the make contact of *A* to ground, thereby causing the operation of said relay. This will open the lamp circuit since the attraction of the armature will open the back-contact, and since it also closes the make-contact, it completes the battery circuit in parallel with the connection just made by relay *C*, the reason for which will become apparent directly. The toll operator is now ready to converse with the subscriber, and she will therefore proceed to obtain the number of the toll party wanted, that of the calling party, and all other information necessary to complete the toll ticket; after which she will tell the subscriber to hang up his receiver, informing him that he will be called as soon as the toll party can be reached. The toll operator will then remove the plug thus opening the jack contact, which de-energizes relay *C* causing its armature to be released, and it, in falling back, opens the circuit through the retardation coil *D*, thus allowing the armature of the tip relay in the local cord circuit at the multiple board to fall back, which will light the supervisory lamp. The relay *B* will remain energized since its battery circuit is completed through one of its own contacts and this will prevent the lamp at the toll board from relighting. The local operator upon getting the disconnect signal will take down the connections and thus release the armature of relay *A* which upon falling back opens the circuit through relay *B*, allowing its armature to drop back, and the apparatus is then restored to its normal state. The toll operator now rings the toll party and, upon reaching the same, she will complete the connection in a manner identical to that previously described for the toll to local connection.

The two-way toll trunk as shown in Figure 8 and the incoming toll trunk shown in Figure 9, has no provision for testing the multiple jacks to ascertain if the line is busy. This feature can easily be added by placing a key in the tip conductor, which in its normal condition closes the circuit, but which upon being operated opens this conductor and connects the plug end of the same through the induction coil in the operator's set to ground. Therefore, if this key be operated and the tip of the plug is applied to the sleeve of the multiple jack of a busy line, a flow of battery will take place giving the operator the regular busy signal, and she, upon finding the line busy, will inform the toll operator to this effect. This naturally means that the operator should make her test before assigning the trunk.

As to whether the system employing the key for adapting the trunk circuit for a busy test is an advantage or not is hard to determine, since this, as well as the system illustrated in our drawings, has its merits and disadvantages. The chief advantage of the method illustrated is that the toll operator, in case she finds the line busy, is able to complete the connection as soon as the local conversation has been finished, without the assistance of the local operator, which will give more rapid service and reduce the work of the local as well as of the toll operator. The principal features of the system employing the test is that the local connection is in no way disturbed by the insertion of the toll trunk plug or by the toll operator breaking in upon the conversation, and further by means of this method the number of trunks necessary will be reduced, due to the fact that these circuits will not be tied up waiting for the release of the desired line.

## *TELEPHONE BONDS AS INVESTMENTS.*

Both in St. Louis and Kansas City Independent telephone companies have won signal success, and the "show me" citizens of Missouri who insist on being convinced of returns do not have to go away from home to obtain the evidence that Independent securities are valuable assets. A St. Louis paper says: "Telephone securities are now recognized among the standard investments of the country and eagerly sought after by investors. And when the enormous growth of the telephone business within the past few years is considered, it is very proper that it should be so.

"About twelve years ago, at the time of the inauguration of the Independent telephone movement, there was comparatively little long-distance service in the country, and it was of inferior quality, with the whole number of telephones of all kinds not exceeding 300,000; whereas at the present time, according to the latest information upon the subject, they number in excess of 6,000.000. No other branch of business can show such phenomenal growth in the same length of time, and as telephones are now recognized as one of the necessities of life, the improvement in the business as well as the character of the service will undoubtedly continue and telephone securities steadily gain friends among the investing public.

"Many of our leading citizens invested heavily in the development of the telephone, both here and in Kansas City, and are now reaping the benefit in the way of large returns for their venture, and through their efforts the citizens of both cities enjoy the benefits of excellent service at very reasonable cost."

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The Independent company of Seattle has just completed two new exchange buildings at Green Lake and West Seattle. The capacity of the two exchange switchboards is 10,000 lines.

# LIGHTNING—ITS PECULIARITIES AND METHODS OF PROTECTION

*Abstract of a Lecture before the Students of Purdue University, Lafayette, Indiana, on January 29, 1907.*

By A. E. Dobbs

SINCE the beginning of historical tradition, lightning has been a mystery not only to mankind, but a source of dread to many animals. Its vivid flashes, coming from none could tell where, its fury of sound, more terrible, or at least more impressive, than any other known, together with its mysterious, sudden and powerful attacks, inspired an awful fear of its dangers, more imaginary than real. The Greeks referred to the lightning as the thunderbolts of Jove, and the ancient artistic representation of lightning as advancing and drawing back in zigzag lines like a javelin thrower taking aim, has continued to be conventional to this day. But it remained to Dr. Franklin and his kite to prove that the lightning of the clouds and electricity were one and the same and the suggestion of protecting houses by means of "thunder rods" followed as a matter of course.

We speak of the freakishness of lightning, but there is no such thing as a freak in an electrical performance. Electricity follows the same laws of directing forces as all other potential differences in nature, and when these laws are understood we may anticipate the probable action of a lightning stroke for almost any conceivable condition.

It has been taught for years, for example, that lightning is an alternating current of very high frequency. The latest researches, however, indicate the possibility that lightning may be manifested in several different ways.

First—As an alternating current of high frequency having enormous capacity and self-induction.

Second—As an alternating current of rather low frequency having greater inductive than static effects.

Third—As a single discharge of very high potential.

The amount of current contained in a lightning discharge has been variously estimated at from a fraction of an ampere to 20,000 amperes, this last figure being obtained some years ago at the Siemens-Halske works in Germany. In this case lightning had struck a fence post and melted three nails in the top, fusing them together. At the works experiments were made to determine the amount of current necessary to fuse three similar nails in half a second's time, and the result was the figure above stated. During the winter time many telephone companies, especially in the west and northwest, have experienced a great deal of trouble from static charges gathering on their lines. They know the lines to be perfectly insulated and the weather dry and cold, but yet the charges sometimes come in strong enough to cause sparking at the relays or between the points of the switch-hook and sometimes the potential is high enough to administer a shock to parts of the body three or four inches away, while in the telephone there is roaring, hissing and sputtering noises that can come from no other source. The remedy for this trouble is to bridge a ringer across the line and ground the center point.

The aurora borealis, those wonderful displays of the far north, are undoubtedly caused by the friction of opposing air currents upon each other, generally at considerable heights above the earth. While these displays sometimes approach the earth very closely, yet it would seem that the most brilliant displays lie very high. In one case, at least, it was estimated that the tongue of flame must have been 500 miles from the earth's surface. It is doubtful whether this observation has been fully substantiated.

We have found three factors that influence the course of the discharge towards the earth.

First—The temperature and density of the air.

Second—The height of the clouds and in some cases the velocity of the wind.

Third—The proximity of springs or bodies of ore in the earth which focalizes the earth potential.

This now brings us to the apparent vagaries of lightning that has struck a building, and brings up the question of static and inductive effects. When a charge of lightning having become focused on a building passes through it may meet with many contending forces, and, as you already know, the direction taken by two or more opposing forces will lie at some point between them. We may suppose then that lightning has struck a rod on the building, and that the rod itself is improperly grounded. Immediately there is set up a static charge of very high potential in all the surrounding conductors of whatever nature they may be. Thus a person standing on the ground twenty or thirty feet away will receive a shock which may be severe enough to cause him to fall.

Every gas pipe, water pipe, or every conductor within the building likewise receives a charge which may be strong enough to discharge again with disastrous effects.

This accounts for the fact that lightning often apparently leaves a lightning rod and tears shingles off a roof in order to reach a gas pipe near by.

While some well known electrical men have vouchsafed the opinion that lightning rods afford little or no protection to houses, and in some cases might even increase the danger by leading the lightning to the house, where otherwise it would be diverted elsewhere, yet, if the writer was going to build a house in the country, he would make sure that it was well protected against lightning. Lightning rods in themselves are to be relied upon for protection, provided they are properly installed; improperly installed, however, they might, as has been hinted before, become a source of danger.

Nearly all text books on lightning conductors tell you that the conductor should run as straight as possible from the roof to the ground. Be this as it may, it is very desirable that the conductor should at lease have as wide curves as possible.

In the protection of telephone cables I once received an idea from Frank Leonard, of Chicago, that may be valuable, or at least, it needs investigation, because it illustrates the point just mentioned. He said that he found from eleven years' experience in the installation of aerial cables that if a single loop two feet in diameter was made in the end of the cable or even a "goose neck" of three or four feet in length, that in case lightning should puncture the cable, one need never look for trouble beyond this loop; that lightning coming into the cable from an overhead line would encounter such impedance at this point that it would jump the conductors and go to the cable sheath every time.

When lightning strikes a telephone line it may follow several courses. If of sufficient intensity it will probably damage the line, but jump to the ground by way of the poles or some of the lightning rods placed on the poles. It is possible, however, that this flash may be divided and jump to the ground by way of the carbon lightning ar-

resters. Even at this, however, the discharge has upset the balance of the lines in the meantime, and even though the original flash may have gone to the ground safely enough, yet the surging of the line caused by its visitation may loosen a heat coil or in some cases even affect the di-electric of the cable conductors or burn out a coil. This is the reason that cable conductors are protected by lightning arresters at each end.

As to the size of these lightning arrester plates, the larger are the more efficient, but as against this we have the fact that the larger they are the more they raise line potential to that of the earth and thus upset the balance so essential to good service.

Of course, if we could maintain the line at the same potential as that of the earth there would be no need of protection of any kind, but it has been the experience of those who have tried it that lines grounded at any other place than at the instruments do not give good service.

The size of the ground wire intended to carry off a lightning discharge should be not less than No. 6 B. & S. at the exchange, nor less than No. 8 at other points. No. 12 wire is sometimes used for this purpose, but it is not good practice because the writer has seen samples of No. 9 wire melted.

The carbon arrester has been the best so far found at a reasonable cost. I understand that some of the exchanges in the southwest are experimenting with copper instead of carbon slugs, the di-electric between them being nothing more than a thin layer of wax. There is one advantage in this kind of slug, it will not place a partial ground on the line; either, lightning will puncture the di-electric and do no further damage, or else it will ground the line so thoroughly that the troubleman must get out and clear it. Some years ago Jay Wurts made up a combination of zinc and antimony alloys, which is still used by the Westinghouse company, which, owing to the peculiarity of the metals employed, resists a tendency towards arcing when an alternating current passes over the line. It is probable, however, that this alloy is too expensive for general use in telephone exchanges and, besides, it is patented. The worst trouble with the carbon slug is that when punctured by lightning a deposit of carbon dust is left which, while not cutting the telephone out of service, makes contact enough with the ground plate to make a very noisy line, and as this is not always noticed by the operator it sometimes is left for several days before receiving attention. It is hardly fair, however, to blame the carbon block for loose inspecting methods.

# TEXAS INDEPENDENTS PROSPER

*Successful Record Made by the Southern Telephone Co. of El Paso*

By E. M. Rothelle.

NO section of the American continent furnishes a more fruitful field for the development and success of the Independent telephone movement than does the great southwest. Tremendous strides have been made in that part of the country within the past few years, during which the railroads have extended their lines in every direction, the population has multiplied and industry and enterprise of all kinds have increased and flourished to a remarkable degree. The resources of the southwest are being developed rapidly and prove that the country has a wonderful future. Texas, of course, comprises the main portion of the southwest. Its wide area, fertile soil, wonderful oil wells, and boundless possibilities make it an empire in itself, and its wide awake, progressive people are amply capable of managing an empire, but, being freeborn American citizens, of course, they run their affairs in typical American fashion. This being true, it follows as a matter of course that the Inde-

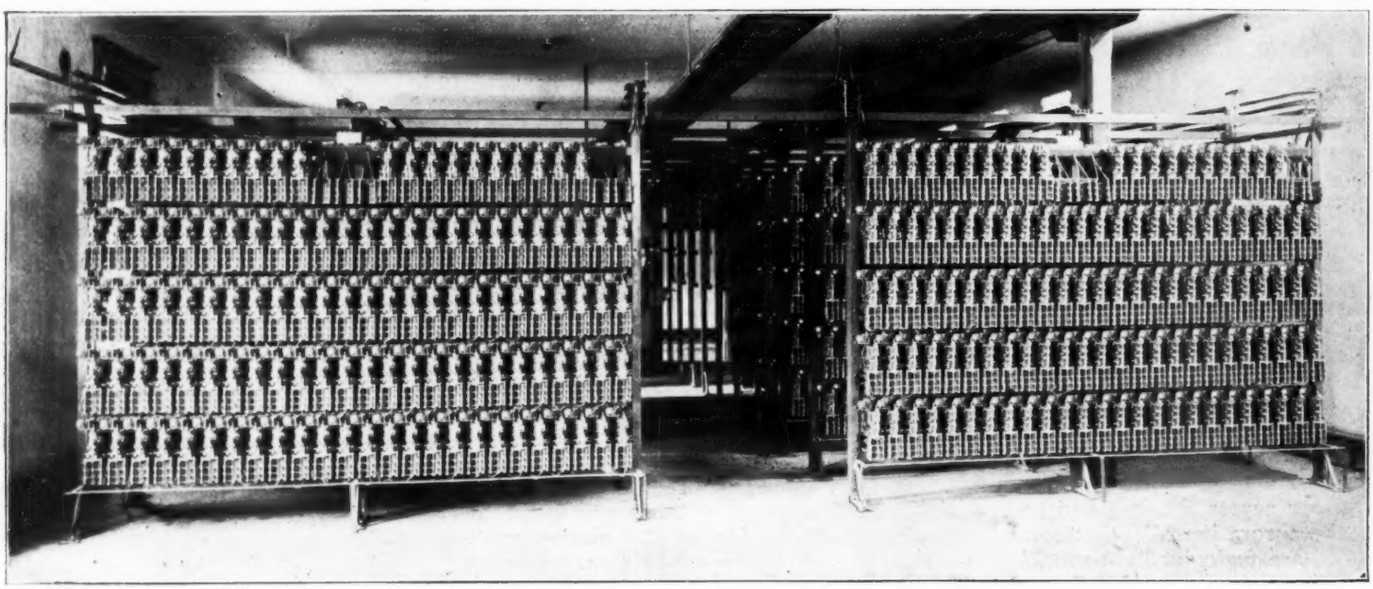

Figure 1—Automatic Switchboard (5,000 Capacity) Installed at El Paso, Texas.

pendent telephone movement is flourishing in Texas. The people of the state have no sympathy with monopoly and have welcomed an opportunity to show their hostility to an arrogant trust like the Bell combine which has sought to make the citizens pay tribute to its power. Establishment of Independent companies throughout the state has given the public a chance to oppose the Bell monopoly, and in all cases the result has proved most beneficial to the home concerns.

A notable instance of this is found in the Southern Independent Telephone Company of El Paso, illustrations of whose equipment and exchange building are given herewith. The Independent company met many obstacles in its organization and final establishment and operation, but all have been overcome and now the concern is on a firm and substantial foundation. The company is capitalized for $500,000, all of the stock being common, and the bonds issued amount to $200,000, which is half the authorized issue. The remaining bonds may be released and used for new installation on a basis of $100 per telephone.

The accompanying illustrations give an idea of the scope of the El Paso company, which is now operating 2,000 telephones. Figure 1 shows the automatic switchboard; Figure

Figure 2—Southern Independent Telephone Company's Building.

2 shows the company's building; Figure 3 the general offices and Figure 4 the protector room, power board, charging machines, wire chief's desk, etc.

Mrs. Anna M. Brett secured the Independent franchise in El Paso five years ago, and she is also given credit for financing the company and putting it on its feet. The original company was known as the Southern Independent Telephone and Telegraph Company, and the concern now in the field succeeded it a few years later. Col. Henry Lepp is the president of the company, J. B. Badger is vice-president, and R. V. Bowden is secretary and treasurer. These three, with Lorien Miller and Mrs. Anna M. Brett, constitute the board of directors. They all take a personal pride in the success of the company and have done much to place it on a firm foundation. The prospects of the future growth of the Independent company are of the best. El Paso six years ago had a population of but 17,000 people, but the city has experienced such a steady development that to-day it contains 45,000. There is every reason to believe that this rate of growth will be maintained, and the progressive character of the people augurs well for those in the telephone business. The people of the Southwest are quick to adopt time-saving devices and appear to have a natural affinity, so to speak, for the telephone. The development of Mexico means the extension of more telephone lines across the Rio Grande river from El Paso, and the Independents are confident of holding their own in the neighboring republic as well as in Texas.

The El Paso company has put in underground construction within the fire limits of the city, and for blocks beyond the limits the wires are below the surface. This move on the part of the Independents compelled the Bell company

Figure 3—General Offices.

to put its wires underground. That the Independent company has first-class equipment and that the system was well constructed is plainly shown by the results reported after the recent heavy storm that swept over that part of the state. Over eight inches of snow fell in El Paso, and both telephone companies naturally anticipated a vast amount of trouble, as big snowfalls are not frequent in that latitude. The Independent company's "trouble shooters" had fewer than a half-dozen serious cases, whereas the Bell company was obliged to keep a large force of repair men at

Figure 4—Protector Room.

work for several days. The comparison highly elated the Independent manager, and the patrons of the Southern Independent Telephone Company also showed their appreciation of the staunch service of the system. On the whole the El Paso Independents are confident they have a much superior plant than their Bell competitors, and feel sure that the people are rapidly reaching the same conclusion.

# DIGEST OF TELEPHONE PATENTS

**By Edward E. Clement**

841,747. Telephone Trunking Circuit. Webster. In this system the trunk line has a disconnect signal associated with the incoming end which is operated through mechanism governed by the current flowing over part of the line when connection is established and the talking circuit completed. Patent assigned to Kellogg Switchboard & Supply Company.

841,769. Telephone Trunking System. Dean. In connection with the usual telephone line there is employed a trunking circuit for tying two lines for conversation. A testing system is employed in which there is a relay for normally connecting the testing system with the trunking circuit and a locking circuit around the relay for maintaining the above condition. An act on the part of the subscriber releases the locking circuit. Patent assigned to Kellogg Switchboard & Supply Company.

841,993. Telephone Switch Hook. Manson. A single sheet of metal bifurcated at one end to form prongs is of sufficient width to be folded along its length so as to make the device double thick throughout its body and prongs. Patent assigned to The Dean Electric Company.

842,178. Telephone Trunking System. Dean. In a copending application there was described a system in which a relay operated over a portion of the talking circuit when the incoming end of the trunk was connected with the called line, served to disconnect the test relay and to place the tip trunk cord in condition for conversation so as to govern the circuits through the ringing signal and locking relay and to disconnect and connect the local circuit of a calling and disconnecting signal. In the present application the relay which is actuated over the talking circuit serves to control a locking circuit of an auxiliary relay which acts as a substitute for the first named relay and which is first operated over the local circuit controlled by the ringing relay. Patent assigned to Kellogg Switchboard & Supply Company.

842,377. Signaling Apparatus. Atwood. This is a lineman's or operator's portable telephone set in which the parts such as the generator, ringer and induction coil are carried in one compartment, and in the opposite compartment is held a receptacle which acts as a switching device at certain times and is adapted to hold the telephone instruments not in use. Patent assigned to Western Electric Company.

842,409. Combined Annunciator and Jack for Telephone Switchboards. Mehren. Adjacent the drop of the annunciator and also adjacent the jack is a small bell crank lever with a loop adapted to surround the plug and so arranged that when the plug is inserted that it will restore the drop to normal. Patent assigned to Eureka Electric Company.

842,410. Telephone Switchboard. Mehren. In this board the annunciators are similar to those described in patent No. 842,409 but employing non-magnetic hangers on their rear ends which extend up and form pivoting arms for the armature and latch rod. Patent assigned to Eureka Electric Company.

842,778. Telephone Exchange System. Fox. This is an intercommunicating system and each substation is provided with a plurality of buttons so that any substation on the line may be called without the intervention of the central office. Assignor of one-half to Michael S. Sheridan of Milwaukee, Wis.

842,832. Telephone System. Turner. Each substation in this lockout system is provided with a plurality of contacts normally set a certain way so that they correspond with no other substation on the line. When it is desired to call any substation from another substation the contacts at the calling station are set to correspond to those of the wanted station. Patent unassigned.

843,053. Telephone Switch. Weman. This is a combined receiver and transmitter or hand telephone set in which the switch is located intermediate the transmitter and receiver and in the handle. A single retaining screw holds the switch in position so that by loosening the screw the entire switch may be released from the instrument. Patent unassigned.

843,078. Telephone System. Eaton. In this system an automatic switch is provided at each substation and is used in conjunction with a push button which controls the circuit of the switches at all other stations so that the operators thereat will get a busy test when attempting to get upon the line being used. Patent assigned to Keystone Telephone Company of Philadelphia, Pa.

843,186. Telephone Dictating Machine or Apparatus. Turner and Germer. This is a system and device for use therewith whereby the manager of an office may dictate letters or otherwise communicate with anyone of his office force without requiring them to leave their desks, and is called by the inventor a "dictograph." The apparatus employed comprises an acousticon transmitter at the central station and an acousticon transmitter at each substation, together with two pair of line wires going from each switch at the central station to each substation so that talk from either point will not be interrupted by talk from the opposite point. Said Germer assignor to said Turner.

843,245. Telephone Trunking System. Webster. This is a trunking system for toll lines in which a trunk circuit is adapted to be connected between a cord circuit and a subscriber's line and in which a clearing out signal is bridged thereacross. A switch at the substation controls current from the main source through the trunk relay over the trunk line and through the clearing out drop whereby the drop will be actuated and the trunk relay will be de-energized to display a signal when the cord circuit is removed from its connection with the trunk. Patent unassigned to Kellogg Switchboard & Supply Company.

843,270. Circuit Catching Device and Electrical System for Use in Conjunction with the Same. Graves. In this system a magnet is used for closing the circuit at a particular substation at the will of the operator, and comprises one winding of high resistance and the other of sufficiently low resistance to be consistent with holding the armature on a shunt, the armature controlling the shunt. Patent unassigned.

843,296. Telephone Relay or Repeater. Parcelle. In this device a conductor of variable conductivity is placed in an intermediate circuit and controlled by the transmitter circuit so that the current of electricity in the receiver circuit will take the path of the magnetic lines of force whereby the variation of current activity will be in exact accordance with the variation in the strength of the magnet due to the electrical undulations in the transmitter circuit. The variable conductor is arranged in such relation to the magnet of the receiver that there is a compression or expansion of material according to the impulses transmitted. Patent unassigned.

843,329. Intercommunicating Telephone System. Dean. In this system each subscriber's station is provided with

a plurality of jacks connected to the lines in the system so that by plugging in and depressing a ringing button the bell of the wanted subscriber is operated, whereupon he answers the signal by inserting his plug in his home jack and removing his receiver from the hook. Patent assigned to Kellogg Switchboard & Supply Company.

843,362. Attachment for Mouthpieces of Telephone Transmitters. Plank. A plurality of sheets of paper perforated transversely are formed into the shape of a cone adapted to fit the mouthpiece so as to form numerous removable concentric linings of antiseptic paper. The outer layer or cone of paper is provided with tabs which are bent over the mouthpiece and secured thereto by an encircling ring. The other layers are provided with projecting ears by which they may be grasped so as to tear them out along the line of perforation. Patent unassigned.

843,871. Telephone Trunking System. Dean. In carrying out this invention the trunk circuit is provided with multiple switch connections at each end in connection with the usual plug and cord. When connection is made with one of the multiple switch sockets at each end, the other sockets located at both ends of the trunk indicate that the trunk is busy, also the signaling apparatus associated with said end of the trunk is rendered inoperative, while at the opposite end of the trunk it remains in condition to operate. A second signal is provided which operates as a calling signal when a connection has been established at one end of the trunk to attract the attention of the operator at the opposite end of the trunk. Patent assigned to Kellogg Switchboard & Supply Company.

843,891. Telephone Receiver. Haff. This receiver is adapted to be used with acousticon and other apparatus for deaf persons. The windings of the receiver are tapped off on one side to a switch contact and on the other side to a stationary contact. A plug is adapted to be inserted within the receiver so as to connect with the switch in the stationary contact and leading to the acousticon or other apparatus. Patent assigned to Kelley M. Turner of New York, N. Y.

843,940. Antiseptic Guard for Telephone Transmitters. Grimm. The mouthpiece of the transmitter has attached to it a guiding plate apertured to correspond with the aperture of the mouthpiece. This guiding plate is provided with a roll of antiseptic paper carried above the mouthpiece and passing down thereover so as to close the aperture in the plate. The paper may be torn off as desired. Patent unassigned.

843,998. Telephone Switch Hook. Cadden. This is a telephone switch hook for wall sets and comprises an insulated base upon which the receiver hook is removably pivoted and adapted to engage and operate a stub lever also pivoted on the base and which is provided with an extension for engagement with the operating spring of the set. Patent unassigned.

844,299. Attachment for Telephone Receivers. Challen. The cap for the receiver has secured over its orifice a concave convex soft rubber dome which is adapted to project into the ear as it were. Patent unassigned.

## *IOWA'S BIG CONVENTION.*

The eleventh annual convention of the Iowa Independent Telephone Association will be held at Sioux Falls, Iowa, March 19, 20 and 21, and the indications are it will be by far the most successful meeting in the history of the organization. Iowa always has enthusiastic and well-attended conventions—in fact, the leaders of that state insist that in that particular it leads the Union—and the progress made during the last year by Iowa Independents insures an increased interest in the 1907 gathering. The Garretson Hotel will be the headquarters, and the programme committee, consisting of C. H. Smith, secretary of the New State Telephone Company, of Sioux Falls; H. A. Douglas, general manager of the Cedar Rapids & Marion Telephone Company, of Cedar Rapids, and J. H. Shoemaker, general manager of the Cornbelt Telephone Company of Waterloo, has been hard at work during the last two or three months preparing a programme which will be practical, instructive and entertaining.

When the convention meets at two o'clock p. m., March 19, the first proceeding will be to name the committee on credentials, after which Charles C. Deering will deliver the president's address. The reports of the officers and committees will follow. F. McNally, of Carroll, will read a paper on "Is It Advisable to Appoint a State Toll Line Inspector?" and W. J. Stanton of Waterloo will read one on the subject, "The Necessary Standardization of Clearing House Toll Lines and Equipment." On Wednesday, at the morning session, the delegates will listen to an address of welcome by W. G. Sears, mayor of Sioux Falls, after which visitors from neighboring states will address the convention. Minnesota will be called on first, followed by South Dakota, for which Judge C. B. Kennedy, of Canton, president of the state association, will speak, and Nebraska which will be represented by R. E. Mattison, of Lincoln, secretary of the association of that state. C. A. Hollison, of Hudson, state agent for Iowa, will speak on "Ourselves." The morning session will close with an address by James B. Hoge, of Cleveland, president of the International Independent Telephone Association, who will speak of the work of the organization. The afternoon session will be devoted to consideration of farmers' and mutual companies' affairs, a question box and a discussion on "Economy in Construction, Labor, Equipment and Management," led by W. D. Dunsmore, of Oskaloosa, vice president and manager of the Oskaloosa Home Telephone Company. In the evening there will be a stereopticon lecture, consisting of slides made from illustrations which appeared in Paul Latzke's "A Fight with an Octopus," published by the TELEPHONY PUBLISHING COMPANY, which has proved one of the greatest successes known. The prospects are that the sale of this interesting history of the Independents' fight with the telephone trust will reach a million copies, and its value to Independent telephone men is becoming more apparent every day.

On Thursday, March 21, the morning session will open with a report of the clearing house for the last year, showing also the prospects for 1907, by George T. Hewes, manager of the Iowa clearing house. Roy Walker of Des Moines will read a paper on "Hints on Management of Traffic." In the afternoon the officers for the ensuing year will be elected, and the place for holding the 1908 convention determined. A. T. Averill, of Cedar Rapids, president of the Cedar Rapids and Marion Telephone Company, will read a paper on "Conservative Financing." In the evening there will be a banquet to the delegates which will be the concluding event of the convention.

The Sioux City Independent Telephone Company and the New State Company have spared neither time nor expense to advertise the convention. They have been materially assistd in this work by other Independents throughout the state. The Blackhawk Local Telephone Association, composed largely of mutual telephone companies of Blackhawk and adjoining counties, has sent out a circular, urging the mutuals to send representatives to the Sioux Falls meeting.

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To prevent the Bell company erecting poles along the roads of their locality, farmers near Cincinnati gathered their children and placed one in each hole that had been dug. Over half the school children in the neighborhood were in the earth up to their chins when the telephone people abandoned their work.

# ARKANSAS TELEPHONE CONVENTION

*An Interesting Meeting of the Independent Telephone Interesis Held at Little Rock, February 18-19*

By Roy A. Warner

THE Arkansas Independent Telephone Convention, held at the Hotel Marion, Little Rock, February 18 and 19, was called to order by Eugene Hale, the president, Mack Hammett, acting as temporary secretary in the absence of John B. King. The morning session was taken up with a general discussion and the appointment of committees, which were as follows:

Nominations—P. C. Ewing, G. T. Brown, H. L. Bernard.

Constitution and By-Laws—P. C. Ewing, Mack Hammett, A. E. Boqua.

Membership—Dr. K. E. Hudson, Dr. R. M. Drummond, Mack Hammett.

Ways and Means—Chas. F. Speed, Dr. K. E. Hudson, W. L. Caldwell.

Adjournment was then taken until 1:30 o'clock to give the committees time to consider. At the afternoon session the committees on ways and means brought in two reports. The majority report was as follows:

"We, the majority of the committee on ways and means, beg to report our recommendations as follows: Exchanges doing business in the state shall pay annual dues of five cents per telephone used, and that long distance companies shall pay five cents per circuit mile. That the Independent telephone manufacturers doing business in the state and exchanges outside of the state, desiring to join the association, may be admitted to the Arkansas Independent Telephone Association on payment of $5 per year dues. We further recommend that the constitution be changed to conform with the above."

Dr. Hudson brought in a minority report as follows: "It is recommended that we assess a $2 fee against all members of the association."

After considerable discussion, in which it seemed to be the idea of keeping the annual dues as low as possible, it was finally moved by P. C. Ewing that the annual dues of the Arkansas Independent Telephone Association be made $1 for each member, and that each exchange pay one cent per unit per year, and that the long distance companies pay one cent per circuit mile. This was adopted.

The following exchanges and companies made payment of the annual dues: Home Telephone Company, Ozark; Little Rock Telephone Company, Little Rock; Pan Telephone Company, Ft. Smith; Russellville Telephone Company, Russellville; Franklin County Telephone Company, Paris; Pine Bluff Telephone Company, Pine Bluff; Falker Telephone Company, Ozark; the Telegaphone Company, Little Rock; Benton Telephone Company, Benton; R. E. Willard, Memphis; E. B. Kramer, Russellville; Stromberg-Carlson Telephone Manufacturing Company, Rochester; Frank B. Cook, Chicago; Atkins Telephone Company, Atkins.

The committee instructed to investigate the proposed legislation relative to physical contact, reported the following resolution:

Little Rock, Ark., Feb. 18, 1907.

To the Senate and House of Representatives of the State of Arkansas:

We, the officers and members of the Arkansas Independent Telephone Association, through its committeee, do hereby recommend that Senate Bill No. 30 (Lambert) do not pass, for the following reasons:

1st. It is monopolistic in its nature, because, as we all know, competition helps the general public on all propositions.

2d. It is our opinion that the passage of a general law compelling two telephone companies to interchange business would result in forcing them to consolidate for their mutual protection. The consequence would be, we believe, a return to conditions practically the same as those prior to the time the patents expired in 1895. There is no line of business in which competition has not been found desirable for the protection of the public, the development of the field and improvement of the service. The results secured in the telephone field since the beginning of competition have amply demonstrated its advantages. Comparatively few people in the United States appreciate the rapid change in the telephone development during the past ten years. To-day there are twenty times as many telephones in use in both systems as there were at the time of the inception of competition.

3. Should this bill pass, the telephone development would stop, and as in proportion to the stoppage of it, the efficiency would also stop, to the disadvantage of the general public.

4th. Section 1, lines 10, 11, 12 and 13, provides that the long distance lines may refuse connections with the local company on the ground that the physical condition of such a company is not sufficient to guarantee good service. It also stipulates that the local company shall comply with regulations of the long distance company, but no provision is made whereby the long distance company shall comply with the regulations of the local company, and it leaves it optional as to whether the long distance company shall make connections or not.

5th. We also further object to the amendment to section 2, which provides for the payment of ten per cent to the local companies by the long distance companies for originating business. This, we believe, is unfair and unjust, as it is not sufficient compensation for the amount of service rendered. The originating of telephone business necessitates a certain amount of clerical work, making out accounts, etc., and in the event of poor collections, no collecting agency would take these necessarily small accounts and collect them for the ten per cent, as this amendment provides that the originating company shall pay to the long distance company ninety per cent of such business at the end of each month, thereby holding the local company responsible for all outgoing messages.

We respectfully ask your honorable body not to pass this bill. It is a matter of vital importance to every citizen of the state of Arkansas, and the passage of the same would work a hardship on the general public by forcing upon them a monopoly in the telephone business.

(Signed.) R. M. Drummond, Chairman.
W. H. Felker.
K. E. Hudson, Committee.

The committee on constitution recommended as follows: "That section 3 be changed so as to read, 'All members of this association shall be entitled to a seat in the convention, but voting power shall be governed by the number of units represented by his company; each multiple of five hundred or a fraction thereof, shall be entitled to one vote. Independent telephone manufacturers and supply dealers can become members of this association by payment of $1 annual dues, but they shall not be entitled to a vote.'

"Also, that in each case where the word 'directors' appears in the constitution, the word 'trustees' shall be substituted."

These changes were adopted. It was then moved by A. E. Boqua that the secretary have made copies of the proposed Senate Bill No. 30, and the resolution relating to the same, and that a copy be forwarded to each Independent telephone company in the state not represented at the meeting and also that the secretary mail a letter to each requesting that the officers thereof correspond with their senators and representatives.

On Tuesday morning the meeting came to order at 10 a. m. The Memphis Telephone Company paid yearly dues as did the Central Telephone & Electric Company of St. Louis. The president appointed the following committee

on legislation: P. C. Ewing, Mack Hammett, Chas. F. Speed. The election of officers resulted as follows:

President—P. C. Ewing, of Little Rock.
Vice President—A. E. Boqua, of Ft. Smith.
Secretary—Chas. F. Speed, of Texarkana.
Treasurer—Mack Hammett, of Pine Bluff.
Trustee—C. L. Humbert, of Jonesboro.

The above officers were elected unanimously and constitute the board of trustees. It was moved by Mr. Boqua that the Arkansas Independent Telephone Association extend its thanks and appreciation to the International Independent Telephone Association for sending its traveling secretary, W. J. Stadelman, to the meeting, and voice its appreciation to Mr. Stadelman in person, for the interest shown and information he had kindly furnished. It was adopted.

It was moved by Dr. Hudson that the next meeting be held in Ft. Smith. This was carried. A motion made by Mr. Boqua extending thanks to Mr. Aaron Smith for the advertising and assistance rendered, was carried. A vote of thanks was extended the New Hotel Marion for the courtesies shown the association. It was then moved by Eugene Hail that the association adjourn to meet in Ft. Smith on May 20th, 1907, and the motion was adopted.

## *AN INTERESTING RELIC.*

TELEPHONY is indebted to B. F. Wasson, president of the National Telephone & Electric Company, of Clinton, Ill., for a glance at a rare old relic of the early days of tele-

THE TELEPHONE

Devoted to Telephony and Kindred Arts.

Vol. 1. Chicago, Ill., May 1, 1889. No. 1.

THE BARNEY TELEPHONE.

OPINION OF THOMAS M. LANAHAN AS TO THE VALIDITY OF BARNEY'S PATENT.

This is a "make and brake" telephone, patented Feb. 8, 1887, and Aug. 21, 1888.

These instruments are very simple instruments on instruments invented by Bourseul in 1854, referred to in the opinion of the United States Supreme Court, 18th March, 1888.

The description published in 1854 is in the following words:

"Suppose a man speaks near a moveable disc sufficiently flexible to lose none of the vibrations of the voice; at each of the vibrations the disc touches a small point placed in front of it, and this counter-acts it to throw the current into the line."

The improvement consists in placing a point on each side of the disc so that the contacts will be made at each half vibration of the disc, instead of at each full vibration, as in Bourseul's transmitter.

Bourseul's receiver is described in the following words:

"At the extremity of the line one current orders an electro-magnet, which attracts another vibrating disc of size and sonority identical with the former; attracted and repelled very rapidly, exactly, and as rapidly in fact as the disc above mentioned, this disc also gets a sound which will have the same musical value as that of the other disc, as the number of vibrations per second are the same in both cases."

The improvement consists in substituting for the soft iron core of the electro-magnet a steel core magnetized.

The Supreme Court of the United States says:

"The method of Prof. Bell consists in creating undulations of the intensity of a continuous current or flow of electricity in a closed circuit."

Barney's system consists in the use of intermittent pulsations of electricity in contradistinction to undulatory currents, whereas Bell's system, the Supreme Court says, "consists in the employment of a vibratory or undulatory current of electricity in contradistinction to a merely intermittent or pulsatory current."

Mr. Thomas M. Lanahan, in speaking of Mr. Barney's patent, says:

"After a careful examination of the two patents issued to Alexander Graham Bell, No. 174,465, dated March 7, 1876, and No. 186,787, dated Jan. 30, 1877, the decision of the Supreme Court of the United States pronounced March 19, 1888, and three patents issued to William C. Barney, Nos. 357,-780 and 357,781, both dated Feb. 8, 1887, and reissue No. 308, 562, dated Aug. 21, 1888, and the records of the Patent Office, I am of opinion that instruments made as described in these patents issued to W. C. Barney are not infringements of instruments made under the two patents issued to Alexander G. Bell; and I am also of opinion that the method described in Barney's patents is not the same method as described in Bell's patent of March 7, 1876, but it is a method simply the opposite of that of Bell's; in fact a method which the Supreme Court said: "Bell found it could not be made, under any circumstances to transmit articulate speech."

We understand this telephone is in successful operation between Baltimore and Washington, thus verifying the homely old saying, "there is more than one way to skin a cat."

THE DRAWBAUGH SUIT.

A POINT IN THE DECISION WHICH PROVED AN EYE-OPENER FOR PATENT ATTORNEYS.

There are several points in the decision of the Supreme Court in the famous Drawbaugh case, decided last March, which deserves a passing notice. It has generally been understood by patent attorneys that a discovery could not be said to have been made and become the subject of a patent until the alleged discoverer had actually accomplished the thing sought for, and thereby made it in fact a discovery. But it seems that the court, in that case, held that a conception of how a thing may be done entitles a party to a patent upon that conception, as upon a discovery. In the "Telephone cases" it appeared that Bell had not at the time of his application for and the issuance of his patent of March 7, 1876, transmitted a single word of speech so that it could be heard and understood by the listener; and yet, because he had conceived how it might be done, he was, as the Supreme Court of the United States determined, entitled to the patent which was issued to him.

The court says:

"But it is insisted that this claim cannot be sustained because when the patent was issued Bell had not, in fact, completed his discovery. While it is conceded that he was acting on the right principle and had adopted the true theory, it is claimed that his discovery lacked that practical development which was necessary to make it patentable. In the language of counsel, 'there was still work to be done, much failing for the exercise of the highest ingenuity and rising for the very highest degree of practical invention.'

"It is quite true that when Bell applied for his patent he had never actually transmitted telegraphically spoken words so that they could be distinctly heard and understood by the listener at the receiving end of the line, but in his specification he did describe accurately and with admirable clearness the powers which, described in the exact electrical condition that must be created to accomplish the purpose. He also described with sufficient precision to enable one skilled in such matters to make it, a form of apparatus, which, if used in the way pointed out, would produce the required effect, receive the words and carry them to and deliver them at the intended place. The particular instrument which he had, and which he used in his experiments, did not, under the circumstances in which it was tried, reproduce the words spoken so that they could be clearly understood; but the proof is abundant and of the most convincing character that other instruments carefully constructed and made in exact accordance with the specifications, without any addition whatever, have operated and will operate successfully.

"The law does not require that a discoverer or inventor, in order to get a patent for a process, must have succeeded in bringing the art to the highest degree of perfection. It is enough if he describes the method with sufficient clearness and precision to enable one skilled in the matter to understand exactly what the process is, and if he points out some practicable way of putting it in operation. This Bell did."

If we understand the court the inventor may no longer bother his head over "experimental" or "practical use."

DEATH BY ELECTRICITY.

NAMES SUGGESTED FOR THE NEW DEATH-DEALING INSTRUMENT OF NEW YORK.

The telegram added a new sensation to life, and now electricity has added a new one to death, although some hair-splitters assert that death by electricity is so sudden as to give no time for sensations. However, the law has come into effect, and it will not be long before the axeless and the lanyardless will disappear, to be replaced by what? A murderer! That is as far as anybody has yet got in describing the curious contrivance which will play such a goodly part in the future gruesomeness to the State of New York. The ax and block of bygone times became unpopular, so to speak, and were supplemented by the equally absurd but less expeditious sawing now in vogue of breaking a man's neck by the force of a fall or jerk, but now science steps in with a piece of mechanism whereby life is extinguished quick as a wink with no physical disfigurement of the condemned man. The new method of execution is even more complicated, for it involves secrecy. The State retains possession of the body instead of giving it back to the friends of the condemned, and proceeds to burn it up with quicklime and bury it within prison walls.

To find a name for all this is what is now puzzling a good many people, and "murder by electricity" is as far as the general public have gone in devising an expressive term. Trial, however, is too long and too indefinite for general use, as there are thousands of modes of death by electricity, both accidental and intentional. A distinct advance in executions was made in France when Dr. Guillotine invented the mechanical headsman, and whom it subsequently immortalized by adopting his name and slightly changing his head. A few new words immediately came into use in France, more or less derived from the inventor's name, and the words which described the new method, the patibulaire, and the various implements were relegated to the linguistic graveyard which science has brought into existence. It was easy enough to christen the guillotine, but the electric executioner is a growth and not a creation, with numerous claimants to the honor of inventing and perfecting its machinery and effecting its adoption by the State. Mr. Elbridge T. Gerry has become chiefly identified with the new method of execution, having long been a stout advocate of that system and worked zealously to have it adopted by the Legislature. His name is not so euphonious as that of Dr. Guillotine, and it is doubtful if he would wish to confer it upon the death-agent, as has been suggested. In addition to being a philanthropist, yachtsman, lawyer, electrician, and miscellaneous amateur Mr. Gerry is a profound Greek scholar and a student of language, who holds a distinct addition to confounded Anglo-Saxon English by inventing the word "cruelest," which is to be found in most recent dictionaries.

When seen by a reporter Mr. Gerry admitted that it was an interesting question what name should be given to the new mode of killing men. He said:

"It is a matter that requires some thought and the World is doing the public service by agitating the question so that an appropriate and fitting name may be devised. 'Electromort' has been suggested, but that would not be a good name, as it is a mixture of Greek and Latin. The original word 'electro' was Greek and meant amber, by which they produced frictional electricity. I think the best name you could give it would be 'Electrolethe,' which is a combination of two pure Greek words meaning death by electricity or electric death. Then, when the sentence had been carried out you might say the man had been electrolethed. The executioner or man who touched the button would be the electrolethist, with the accent on the third syllable. Other derivations might be made as required to describe various parts of the machinery or the process. Yes, I think electrolethe is the proper term, and that is my suggestion."

"The Kinestrope" was another suggestion, and "the Mortberthe," or chair of death, another. The picturesque if gruesome figure of the axeless will disappear from contemporaneous life, the block cap, the noose, the hangman, will all be relegated to the past, and a barber's chair and a brass wire take their place.—New York World.

THE TELEPHONE IN CONVERSATIONS.

One of the facts brought out in the Trowbridge divorce case recently decided at New Haven, Conn., is of peculiar interest from the fact that conversation surreptitiously heard on a telephone line was introduced as evidence in court. As this is becoming suspicious that all was not well with the domestic affairs, caused a telephone wire which ran to his house to be tapped, and a stenographer was employed to take down everything in same. The conversation which he overheard and transcribed was introduced as evidence, and played an important part in the case. A few such incidents as this will tend to make conversation over the wire even more guarded than it commonly is at the present time. It has been justly observed that much of a man's character can be learned from the way he talks into a telephone. We cannot remember when the telephone was put into commercial use, being sometimes addressed by an unseen, and often unknown speaker, in language such as a man would rarely use face to face with another man. Even now one can usually tell a person who has rarely used a telephone by a certain relaxation in the common courtesies of speech. There is an impersonality connected with the act of speaking by the aid of a mechanism which has been lowering in its tendencies, for it is only by the personal presence of others that many men's speech is kept in restraint. On the other hand, a man of true refinement can usually be told by the courteous and graceful language he uses when at the transmitter.—Electrical Review.

Fac-Simile of the Title Page of The Telephone.

phone development. It is a copy of No. I, Volume 1, of "Telephone," a journal "devoted to telephony and kindred arts," printed in Chicago May 1, 1889. This date is so recent that in any other industry it would scarcely be considered pioneer times, but the real growth of the telephone movement is of so late an origin that to most men now in the field it seems a far cry to 18 years ago. The initial number of "Telephone" consisted of eight small pages containing reading matter which now sounds like a veritable voice from the far away. What seemed then to be scientific marvels are now ordinary, every-day affairs, and it requires only the most casual glance at the two conditions to comprehend the wonderful strides made by the telephone movement within the life of a high school boy. Even in 1889 "Telephone" was fighting the Bell monopoly, accusing it of charging exorbitant rates and criticizing its arrogant policy toward the telephone policy. An article in the first number of the journal states that the Bell in 1889 operated 6,400 telephones in Chicago and charged $125 a year for each instrument. There was a Telephone Users' League of Chicago then, which was trying to pass a bill in the legislature for the state regulation of rates. The "Telephone" was impressed with the claims of Dr. S. D. Cushman, who asserted that he, and not Bell or Gray, was the real inventor of the telephone. Dr. Cushman was engaged in the manufacture of telephones, and was sued by the Bell company for infringement of patents, the United States courts finding for the plaintiff. The court decision didn't settle the question to the satisfaction of "Telephone," however, as the pioneer paper continued to insist that Cushman was the original discoverer of what came to be known as the Bell telephone. A curious feature of the first number of the old telephone periodical is an article on the art of conversing over the wire, which says, "One can usually tell a person who has rarely used a telephone by a certain relaxation in the common courtesies of speech. There is an impersonality connected with the act of speaking by the aid of mechanism which has been lowering in its tendencies, for it is only by the personal presence of others that many men's speech is kept in restraint. On the other hand, a man of true refinement can usually be told by the courteous and graceful language he uses when at the transmitter." Nowadays the telephone is recognized as an influence for becoming language, for few care to "cuss" in the hearing of the "Hello" girl.

Mr. Wasson possesses an interesting collection of relics of early telephone days, and has exhibited it at several expositions. The collection is an eloquent reminder of the marvelous progress made in the industry within the last two decades.

## *VEXATIONS OF THE TELEPHONE.*

"Hello!" exclaimed the man at the telephone. "Is that four-double one, Chester?" says an exchange.

"Yes," answered the man at the other end of the wire.

"Is Mr. Carson there?"

"Who?"

"Carson! Carson!"

"I don't catch the name."

The voice, already loud, became strenuous now.

"I said Carson!"

"Parker?"

"No! What's the matter with this telephone, anyhow? Carson!"

"Harper?"

"Naw! Carson! C-a-r-s-o-n! Get it now?"

"Oh, Carson. Yes, I believe there's a man of that name in the next room. Shall I call him to the telephone?"

"If you please."

Then he added, in a much lower tone, and speaking to himself, "A man that can't hear it thunder oughtn't to try to talk through a telephone."

Whereupon he distinctly heard the response, also in a low tone:

"A man with a fog-horn voice doesn't need a telephone. Let him get up on the roof and shout."

The moral is, it is not always the fault of the telephone.

# TELEPHONY IN RAILWAY SERVICE

*Abstract of a Paper Read Before the New England Street Railway Club*

By C. J. H. Woodbury

ELECTRICITY was considered for railway signaling long before the devices for its application were invented, for in 1828 Edward Davy, of England, made a proposition for the application of electrical signals for indicating the direction of trains, whether stationary or in motion, which appears to be the first available record on the application of electricity to train movements. It does not appear that this form of signaling was proposed to extend beyond giving information to the general superintendent, and did not fully include any suggestion for telegraphing orders which pertained to later applications of the telegraph.

The Wheatstone telegraph was applied for signaling on a cable railway at Blackwall, England, in 1835. On the whole, the application of electricity for the communication of intelligence in both directions appears to have originated with the use of the Morse telegraph in 1850 on the Erie railroad by Charles Minott, general superintendent, although it is claimed that previous to that date railroad men had availed themselves of the telegraph to direct the movement of trains, but his work on the Erie railroad included the systematic dispatching of trains. This with steam railroads, has been developed into a most systematic and thoroughly organized department which was an essential portion of the operation of every steam railroad.

Of late years the telephone has taken the place of the telegraph to a very material extent, and its use is rapidly increasing.

The facility which it furnishes for the instantaneous reply, and the conference over matters requiring a presentation of facts at one end and the exercise of executive action at the other without the interposition of skilled telegraph operators, is of great value, especially on occasions of emergencies.

The telephone is admirably suited for application to existing telegraph plants in railway service, for its attachment to such lines does not interfere with the use of the telegraph, nor does the simultaneous use of the telegraph affect the transmission of speech by telephone.

This dual use of the same wires for composite systems is accomplished in a simple manner by the insertion of choke coils at the terminals, and also bridging condensers around the telegraph relays.

These condensers will transmit the alternating currents used by the telephone bell and the undulatory currents of the telephone, but they do not conduct the direct currents used in telegraphy.

That is, the condensers serve in the place of conductors for telephone service, and as insulators for telegraph usage.

These composite sets were first commercially used in New England by the Central Vermont Railroad, and their application extended to a number of steam railways throughout the country.

The term "labor-saving" invention is generally a misnomer for production-increasing devices, but the telephone is in the former class, as Mr. Frank Thompson, president of the Pennsylvania Railroad, said that the telephone was the only invention introduced during his business career which had been a time-saving device, for while all of the others had added to his work, the telephone had enabled him to transact his duties with so much greater rapidity that it gave him more time to devote to matters of the policy of that great corporation.

The manifold applications of the telephone is indicated by some of the railroads which also have connection with the mining of coal, and their private branch exchanges not only connect with the offices at the headquarters of various divisions of the railroad, the operation of trains, but also extend down into the coal mines and out to the docks where the coal is shipped, and are even connected to telephones in the cabins of the vessels transporting coal, or the tugs which tow the coal barges. On the Mexican Central Railroad all of the cabooses are equipped with telephones so that all freight trains may be at any time in communication with the superintendent's office, in the same manner that the wrecking cars of steam railroads are equipped with telephones which can be attached temporarily to wires of telephone lines near the road by means of rods carrying wires ending in hooks and in that manner coming in communication with the supervising officers.

One of the many instances of the service of the telephone in cases of grave emergency occurred on May 11, 1905, when a passenger train near Harrisburg struck a car loaded with dynamite, whose explosion killed twenty-one and wounded 150, who were taken to the Harrisburg hospital.

The Pennsylvania Telephone Company set up a private branch exchange in that hospital which was operated by L. H. Kinnard, general manager, while J. A. Crossman, Jr., secretary and auditor of the telephone company, established a card index system on which the names of the wounded and dead were placed as far as known, with the nature of the injuries and the probable outcome of the case as judged by the surgeons in charge. This card index also contained the exact location of the patients in the hospital wards and was continued with additional information from the examining surgeons and ward physicians. Free service was established not merely by the Pennsylvania Telephone Company, but also by the American Telephone and Telegraph Company, with its long-distance plant, so that inquiries from various parts of the country, even to distances of a thousand miles, could be answered at once in a prompt and intelligent manner.

Some of the leading express trains are equipped with telephones which are attached to the central office system at terminals, and also at intermediate points where the stay is longer than for the change of passengers and baggage.

In the early days of electric railroads when the motor was merely a substitute for the horses on the same cars and even at similar speed, there was not the requirement of any signaling system more than the unfilled need which had already existed in the case of horse cars, but with the expansion of the carrying capacity of a road both as to size of cars and speed of propulsion, and above all the long distances of the interurban roads, conditions became radically changed and were comparable to those of the steam roads. This development of the transportation facilities became so much more rapid than that of the signaling that the early electric roads were afflicted with a number of mishaps which gave rise to many serious apprehensions as to the advisability of this change of power.

In electric railways the conditions of speed are comparable to those of steam railway trains and the weight of the cars sufficient to cause destructive results in case of collision, while the requirements of good service at these speeds demanded that there should be constant information of the positions of the various cars en route.

The street railways had the advantage of precedent, and

in New England the Worcester street railway began to use the telephone in 1899, and since its consolidation with other companies these ramifications extend over a large range of territory throughout the heart of the commonwealth.

The application of the telephone for train dispatching has resulted in a marked economy of both plant and operation in that the ability of the superintendent to be informed as to the position of the various cars and to communicate with their operators gives a greater service efficiency to the road. Single track railways in sparsely settled districts can be operated at an efficiency which should otherwise require a double-track road, merely by the use of the telephone for dispatching, because in case of cars failing to join at meeting points when they are due, they may under this direction avoid delaying the prompt car by directing it to proceed to another tournout. In case of failure to meet at scheduled turnouts there is not the risk of collision by one car running wild to the next switch.

On double-track roads knowledge of occurrences to the rolling stock or of the condition of the road has a similar value, which increases with the congestion of travel.

The telephone is of great service in severe snow storms by the facility which it affords for information to be given to the train dispatcher as to the condition of the road. It is said that in the old days, before the use of the telephone, snow-plows became snow-bound and lost, because whenever a snow-plow or a car disappeared from the sight of the terminal it was never heard from again until it arrived at the other end or perhaps not until it returned to the starting place.

In cases of mishap the telephone affords means for the quick clearance of the track by the facilities of obtaining wrecking cars or repair hands.

In cases of accident not only can medical help be summoned for the injured, but means can be taken to procure information relative to details of the occurrence which may be of great importance in ascertaining the liabilities of the company.

The efficiency of the telephone in times of emergency was illustrated last June by an incident on an interurban electric railroad west of Frankfort, N. Y., where the cars were limited to the single track during repairs, and to protect the car in the block watchmen were placed at each end. One evening a car went upon this single track at full speed when a car was approaching the other end of the block, and the watchman knew that a collision would be inevitable unless the cars were stopped. There was no time for long stories; he went to his telephone and told the power station to shut off the current, which was promptly done, and a collision averted.

There are three types of application of the telephone to railway dispatching:

(1.) Fixed telephone substations in booths placed at suitable points along the line.

(2.) Jack boxes at poles to which portable telephones carried in the cars may be hung and connected for temporary use.

(3.) Portable telephone sets hung upon the front of the cars, whose vestibule platform serves as a booth, and attachment made by flexible wires to jacks at numerous poles along the line.

On some railway lines the method of connecting a telephone on the car with the line is not by means of a jack at the side of one of the poles but by a long slender rod carrying the wires which may be hooked upon the main lines at any place.

The first method does not differ from arrangements of telephone booths with which all are familiar, except in minor details, and does not require explanation.

Portable sets are generally preferred to fixed sets for long mileage and few cars. There are several forms of these portable sets, one with its magneto telephone, coil and dry battery weighing only thirteen and one-half pounds, although more substantial forms are considered preferable.

Jack boxes on the pole must conform to numerous conditions, not merely to be shot-proof or fool-proof against meddlesome people, but also they must not afford shelter for hornets or other insects of perhaps less virulent disposition, but who impede any such apparatus by the nests which they make; they must also be proof against damage by rain or snow. The telephone wires should be strung below lighting or power wires and well insulated at its points of support. The lines of such telephones must be transposed at least once in every eight poles, in order to prevent noises on its circuit induced from the wires in its vicinity carrying disturbing currents.

When two telephone circuits are on the same line the transposition must be not only alternating the relative positions of the wires of one circuit to the other, but also of the two circuits. When the spring jacks in an iron box attached to a pole are connected to a common battery signaling system, the two plugs on one handle are of different size, so that they cannot be inserted with wrong poles.

Although still called jack boxes, the plug in the later forms is attached to the under side of an iron canopy, resembling a large petticoat insulator, and the spring jacks are in the handle at the end of the flexible wires leading from the telephone set. On account of the exposure of these telephone lines to foreign currents extraordinary care should be taken for their defense at every jack or other point of connection, by the use of protectors and repeating coils.

The telephones used on electric railroad systems must give transmission which is clear and loud, and be of types not liable to be placed out of service by the jar of continuous transportation on a car. Fixed telephone sets are found preferable on electric railways having a large number of cars and congested traffic, as they may be used more rapidly by merely attaching the flexible wires to a pole than when it is necessary to take a telephone set from the car and hang it upon a pole.

Especially in stormy weather it is a distinct advantage for the motorman to use the telephone in a vestibuled platform which serves as a booth.

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## *TELEPHONES IN ALASKA.*

The land of the Klondike has telephones as well as rich gold mines, but few people, perhaps, realize that Alaska contains more than 1,000 miles of lines. Most of the important and older mining camps and fur trading stations are connected by telephone. The line from Nome to Tin City is the longest, being 157 miles long. It is the only line in Alaska in which a submarine cable carries the messages for a part of the distance. This cable is under Grantley Harbor, near Teller. To guard against accident, an aerial wire is also strung, the poles on either side being 120 feet high. The second longest line is to Candle Creek, a distance of 138 miles, from Council, the course carrying it through the Council district. There are two lines to Kougarok, one of 122 miles and the other of 130 miles. A wide expanse of barren, uninhabited country is covered by the Candle line, which was the cause of much hardship and heavy cost at the time of construction.

At Craft's Roadhouse, near White Mountain and the junction of the Niukluk and Fish Rivers, there is a telephone which is kept busy from morning till night by freighters and merchants between Chinik and Council. All the camps along Solomon River are provided with telephones, as are most of those on Nome River, Dahl and Taylor Creeks. The main exchange is at Nome, where there are two local switchboards and one long-distance board. There are 130 camps and roadhouses provided with telephones, in addition to numerous instruments situated within the "city limits" business houses and cabins of larger camps.

# A MODEL TELEPHONE EXCHANGE

*The Albia (Iowa) Independent Company Makes an Excellent Record*

By E. M. McMeal

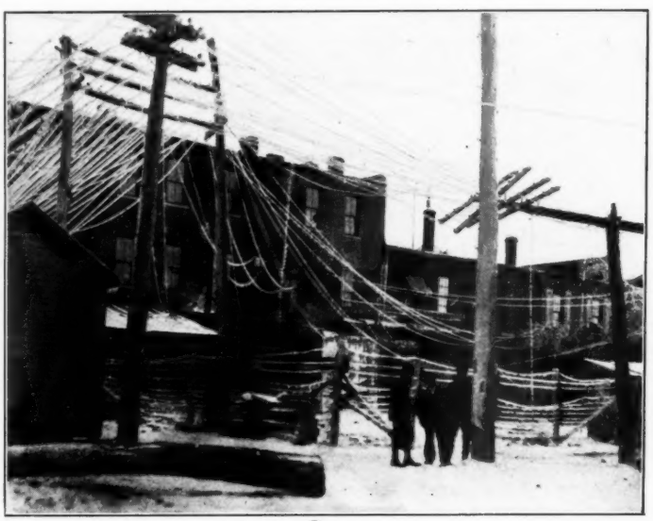
THE state of Iowa contains many first-class, prosperous Independent telephone companies, and none is more worthy of favorable comment than the Albia Telephone Company, with headquarters at Albia, which owns and operates the exchanges and toll lines in Monroe county. It is managed and controlled by Iowa men and has made a record for efficient service that has popularized it with all its patrons. There are 825 telephones in the system and 300 miles of toll lines covering all of the county. Albia is the county seat and has a population of about 5,000, so that there is a telephone in use for every six persons in the city. The Albia Telephone Company is capitalized at $50,000, and

Building of the Albia Telephone Company, Albia, Iowa.

succeeded the Western Telephone Company, which was established in October, 1897. The Albia company took over the system October 1, 1900, paying $12,500 for the plant, which then had but 200 telephones and no farm or toll lines.

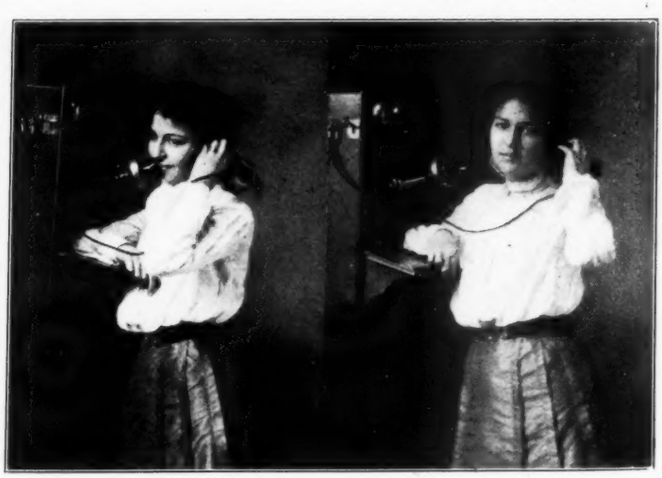
Grant M. Heiserman is the president and general manager of the company. He is a prominent figure in the business circles of that part of the state, being president of the Acme Telephone and Manufacturing Company, owner of the Albia building and identified with other important interests. J. S. Moon, the treasurer of the Albia Telephone Company, is connected with Moon and Company, dry goods merchants, and is also interested in banking and telephone manufacturing enterprises. E. J. Renz is the secretary of the company. These three gentlemen, with J. C. Johnson and J. C. Robeson, are the directors in the Albia Telephone Company.

In January, 1904, a terrific storm of sleet and snow swept over the locality and played havoc with the telephone lines.



Showing Effect of Sleet Storm, Albia, Iowa.

The illustrations accompanying this article give an excellent idea of the damage done the wires and poles by the heavy sleet which encased the lines and put the service entirely out of commission. One of the scenes shows that new poles were set in place of the broken ones. The storm broke down the lead at about 6 o'clock in the morning, and by 3 o'clock

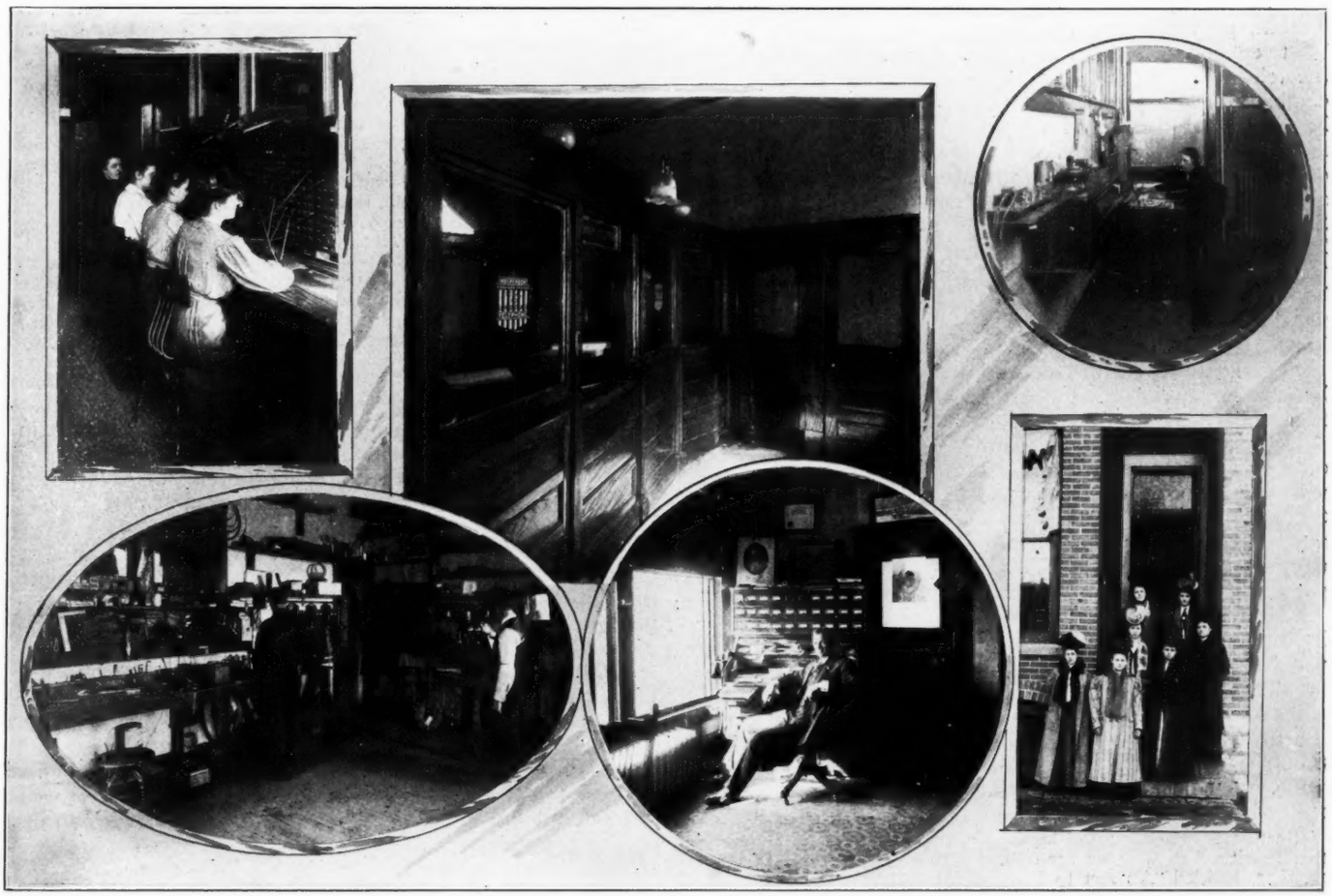


Miss Blanche Heiserman Showing the Right and Wrong Way to Use a Telephone.

in the afternoon the new poles were set for several blocks. So severe was the weather that the sleet remained on the wires for nearly three weeks. After completing repairs the management of the company decided to rebuild the entire plant, and President Heiserman erected the present three-

story building for his company, which is fireproof and modern in every respect. The system as rebuilt is metallic, and practically an all-cable plant. All of the equipment put in was turned out by the Acme Telephone and Manufacturing Company, and it gave such excellent service that the moving spirits in the Albia operating company decided to secure a controlling interest in the Acme concern. This they did, and moved the Acme factory to Albia, where it has become one of the important industrial institutions of the city.

The staunch support given by citizens of Albia and Monroe county proves that they appreciate the excellent service rendered by the Albia Telephone Company. This support has enabled the company to equip and maintain the system in first-class shape, and the Albia exchange is known as one of the best in the state. The Bell company had an exchange at Albia but has abandoned it and now retains only a toll station there. The people of that section of Iowa are enlisted on the side of the Independent telephone movement as represented by the Albia Telephone Company.



Interior Views Albia Telephone Company, Albia, Iowa.

## *TELEPHONE TROUBLES IN FRANCE.*

Citizens of Paris are thoroughly disgusted with the telephone service which is managed by the government. So wretched has the service become until it is said that in nine cases out of ten it is impossible to get communication at all, whereas formerly it was merely difficult. Finally the subscribers arose and petitioned the chamber of deputies to effect a radical reform in telephone service and bring it up to the standard of perfection which obtains "in all the great nations of Europe and in America especially." The petition was signed by 25,000 subscribers, including 7,200 members of an association organized to secure an improvement of the telephone service in France. M. Gerald, who was charged with drawing up the petition, laid stress on the important part played by the telephone in modern life. He says: "In America it is regarded as one safeguard of public security," and then declares that the telephone service in the United States is admirably organized and may be considered perfection to that in vogue in France. Mr. Gerald recently paid a visit to America and reported to his countrymen that in the states communication is established invariably in a few seconds and the cost of subscription is so reasonable that no home is complete without one.

In France the most irritating feature is that as telephone employes are government servants they treat subscribers with open contempt. For example, the Marquis d'Albufera rang thirty minutes recently without receiving any reply.

The marquis at once demanded to be put into communication with the superintendent. He was dumbfounded when the man answered:

"He's not here. Besides, this affair doesn't concern any one except me. If you want to lodge a complaint against me, go ahead."

Mlle. Sylviac was prosecuted by the state about three years ago because in a fit of exasperation she compared a telephone girl to some animal or other. Mlle. Sylviac was acquitted, but the telephone administrator had the nerve to fine her by cutting off telephonic communication with her house for seventeen days.

M. Simyan, undersecretary of state for this department, promises to effect great improvement in two years. Similar promises have been made by his predecessors so often that subscribers are reminded of the old sign in a barber's shop, "We shall shave gratis to-morrow." Where the French telephone service is concerned improvements are always to be made to-morrow—next year.

# BELL TRUST BEATEN IN TENNESSEE

*Both the Legislature and Chancery Court of Appeals Go on Record for Competition—The Independents Successful After a Six-Year Fight.*

By H. S. Cranfield

[This story should appeal to those who have good, red American blood in their veins. It is the story of a magnificent fight that was won against overwhelming odds. It is the story of a smug coterie of "Boston gentlemen" of the immaculate type, put to flight by a few sturdy men out of the West. It is the story of a low, scheming campaign of greed, that was turned into a rout by a fine, sentimental, American citizenship. It is a story full of dramatic interest, not because of the manner of telling, which is simple and common-place enough, but because of the facts it relates.—*From Foreword of Paul Latzke's "A Fight With an Octopus."*]

IN the passage by the Tennessee legislature of the Talbert bill, providing for the incorporation of telegraph and telephone companies and their regulation, a chapter in the telephone war between the Independents and the Bell combine is closed that is in no way less important in its bearing upon the entire telephone industry, less valuable as a curb upon monopoly, or that has been secured with less effort than the most striking instances related in Mr. Latzke's absorbing book. In this case a "few sturdy men out of the South" refused to let up until the trust was brought to its knees. This fight in Tennessee has been more than a contest for telephone regulation, either city or state. It has been primarily a fight for general industrial freedom, and the throwing off of the bonds of monopoly in all public utilities. As a matter of fact, it is the first real blow dealt at such monopoly in Tennessee, and the Talbert bill is regarded by eminent authorities to be the most far-reaching legislation enacted in the state in a quarter of a century.

To telephone people in general the struggle for this piece of legislation is particularly interesting because the issue was fought out on the question of telephone competition in the home of one of the Bell trust's most strongly intrenched and, in many ways, one of its best paying subsidiary companies—the Cumberland Telegraph and Telephone Company, with headquarters at Nashville, Tennessee. From a practical monopoly of the telephone business of the state—in fact, 80 per cent—the Cumberland is now faced by a law which permits rival telephone companies to enter any town or city in Tennessee, and which further gives powers to cities and towns to regulate rates and exact rentals for the use of their streets, which is almost a complete reversal of things as they have been under a purely monopolistic regime. The Talbert bill is well worth setting down here in full. It follows:

Section 1. Be it enacted by the General Assembly of Tennessee, that Section 8 of Chapter 142 of the Acts of 1875, approved March 23, 1875, entitled "An Act to Provide for the Organization of Corporations" be amended so that said Section shall read as follows:

Section 8. Be it further enacted that the charter for a telegraph or telephone company shall be as follows:

State of Tennessee, ————, Charter of Incorporation.

Be it known that (here insert the names of five or more persons not under 21 years of age) are hereby constituted a body politic and corporate, by the name and style of (here insert name of the corporation), for the purpose of constructing a telegraph or telephone line from ————, in the county of ————, to————, in the county of ————. Both termini may be in the same county.

The general powers, etc., of the corporation are (here insert the powers, etc., as set forth in Section 5 of Chapter 142 of said Acts of 1875).

Said corporation may construct a telegraph or telephone line and erect the necessary fixtures along or over or under the line of any public highway, the streets of any village, town or city, across or over or under rivers or any lands belonging to the state, or along, across or under county roads, and also over the lands of private individuals, in pursuance of the general law, authorizing the condemnation of the easement of right of way, for works of internal improvement, as set forth in Sections 1325 to 1348 in the code of 1858, both inclusive; *Provided*, that the ordinary use of such public highway, streets or county road be not thereby obstructed, or the navigation of said waters impeded.

While *any village* or *city* within which said line may be constructed shall have all reasonable police powers to regulate the construction, maintenance or operation of said line within its limits, *including the right to exact rentals for the use of its streets*, and *to limit the rates to be charged*, provided that such rentals and limitations as to the rates are reasonable and imposed upon all *telephone* and *telegraph* companies without discrimination; no village, town or city shall have the right to prevent said company from constructing, maintaining and operating said line within said village, town or city so long as said line is being constructed, maintained or operated within said village, town or city in accordance with said reasonable police regulations.

The said corporation shall, in all cases of war, insurrection, civil commotion or for the arrest of criminals, give immediate dispatch, at the usual rates, to any message sent by an officer of the state, or of the United States.

All messages, including those received from other telegraph or telephone companies, shall be transmitted in the order of their delivery correctly, without unusual delay, and at the usual rates; and shall be kept strictly subject, however, to disclosure in any legal proceedings.

Section 2. Be it further enacted, that said act take effect from and after its passage, the public welfare requiring it.

Up to this time telephone companies doing business in Tennessee have operated under Chapter 8, Section 2830 of Shannon's Code of Tennessee, which provides as follows:

*"Right of Way to Telegraph or Telephone Companies.*—Any person or corporation organized by virtue of the laws of this state, or of any other state of the United States, or by virtue of the laws of the United States, for the purpose of transmitting intelligence by magnetic telegraph or telephone, or other system of transmitting intelligence the equivalent thereof, which may be hereafter invented or discovered, may construct, operate, and maintain such telegraph, telephones, or other lines necessary for the speedy transmission of intelligence along and over the public highways and streets of the cities and towns of this state, or across and under the waters, and over any lands or public works belonging to this state, and on and over the lands of private individuals, and upon, along, and parallel to any of the railroads or turnpikes of this state, and on and over the bridges, trestles, or structures of said railroads."

After this act had been in force for a number of years its constitutionality on technical grounds was questioned, and the Independents were thereby prevented from utilizing a law under which the trust had constructed and maintained its plants in Tennessee.

In his dramatic recital of the fight between the Independents and the telephone trust, Mr. Latzke relates no more heroic narrative than the fight just waged here. All he has written of the manipulation of courts, the juggling with town and city councils, and the subsidizing of the press, has been duplicated in the Tennessee fight. Corruption, lying, and deception have been practiced as openly and ably here as elsewhere, for their inspiration has been that same brand of "Boston gentlemen," represented by a local organization of more power and cunning than the trust has been able to muster in many other fights.

To appreciate thoroughly the successful storming of this citadel of industrial arrogance, it is necessary to go back a few years—for it has been a six-year fight, growing fiercer as time went by. In telling of this fight it is necessary to dwell mainly on the attempts of the Independents to get

into Nashville, for Nashville has long been the key to the state situation, and the long distance route south as far as the Gulf of Mexico. Nashville is likewise the home of the Cumberland Telegraph and Telephone Company, which not only holds a monopoly of the telephone business of Tennessee, but that of Mississippi, Louisiana, and, until recently, Kentucky, and portions of Indiana and Illinois. This licensee of the Bell has had the usual long tenure of life, with the usual training in "Boston methods" absorbed to a high degree, and added to this a native cunning of a high order. As a result, its intrenchment has to date seemed impregnable.

The Cumberland has steadily grown more paternal in its attitude toward the people, until by "benevolent assimilation" it has usurped and performed many functions that ordinarily do not belong to the telephone business. Its watchfulness over the legislature has been especially marked by success. City and town councils have received no less attention, and, as such things usually go, the Cumberland's success turned the heads of its promoters and they overreached themselves, with the result that the Talbert bill became a law. With its hands in everything, this giant corporation came to be feared and detested, so when intelligent, honest, and fearless leadership appeared, the indignation of the people extended to the legislature, and to a governor who had independence and backbone. The result is the loosening of the trust's hand from the public throat. It has been in many ways a regime quite like the Bell methods elsewhere, carried out with even more adroitness than in most other cases, for the officers of the Cumberland are men of great ability.

The Nashville fight began in October, 1901, when Harvey Myers and his associates operating an Independent plant at Memphis, made an application for a franchise in Nashville. This move was met by the organization of a dummy company, created by the Bell, which applied for a franchise in November, 1901, and offered lower rates—so low in fact that no company could live. This drove out Myers and his people and the dummy company soon suspended action. In June, 1903, Myers' application was renewed. The dummy (the Tennessee Telegraph and Telephone Company) did not have time to revive its application, owing to a ninety-day clause in the city charter, but it succeeded in inducing the committee in charge to leave the matter to the council coming into office in October, 1903. During November, 1903, the Tennessee Telephone Company ordinance was renewed and, no competition coming up, it slumbered until February, 1905, when the Home Telephone Company ordinance was introduced. Then it was revived and pushed in order to defeat the proposed competition, later dying, but not until it had inflicted a death blow on the Home application. Another dummy (the Thatcher-Mitchell bill) was introduced in June, 1905, and lasted until August of the same year, when it was withdrawn.

Meanwhile the question of telephone competition had become a leading issue in the city campaign. The people had become thoroughly disgusted with the vacillation of the city council, and candidates for mayor and the council were pledged to submit properly to the people the question of voting on the telephone question. The ticket so pledged was elected. The position of a majority of the newly elected council and the mayor is illustrated by the following quotation from an open letter of Mayor-elect Morris just before the close of the municipal campaign: "If elected mayor I will not close the door of progress by repelling capital seeking investment in Nashville and the city council shall not deny the people the right to vote on a legitimate enterprise like that of the Home Telephone Company without a vigorous message from me telling them that their conduct is without precedent, a disgrace and a public scandal."

In October, 1905, the Nashville Home Telephone Company's application was introduced before the supposedly friendly council. The committee appointed to consider the application ignored it, and without authority entered into secret negotiations giving exclusive privileges to the Cumberland, for $10,000 a year, so long as the city council refrained from granting a franchise to any competitive organization. After this was consummated in secret session the application of the Home Company was refused. And the same mayor who delivered this patriotic effusion upon competition, attended the clandestine meeting and later signed the contract with the trust.

Few more striking examples of double dealing have been met in all the fights with the trust. Only men of exceptional courage could have been expected to go ahead after such reverses, but the moving spirits in the Nashville Home Company have been E. L. Barber, president of the Central Home Telephone Company of Louisville, and R. E. Cooper, president of the Hopkinsville (Kentucky) Home Telephone Company. Both had lined up against the trust before and been knocked down, but getting up and brushing the dust from their clothes had gone ahead undismayed, and with substantial success, as the telephone world well knows.

Despairing of receiving fair play at the hands of the Nashville city council, it was determined to carry the fight to the people of the state. The campaign directed by Luke Lea, the attorney for the Independents, was wisely put on the broad ground of general competition in public utilities. While this necessarily brought other corporation opposition to bear against the telephone problem, it was an assurance of sincerity on the part of the advocates of the Talbert bill.

The election of Governor Patterson was a direct blow at the trust. In addition, the new legislature contained many members desirous of lifting the corporate heel from the public's neck. With its convening in January, the battle was on. The Cumberland people scented trouble and made their usual elaborate preparations to "control" legislation. All sorts of measures tending to confuse and divide the house and senate were introduced. Suddenly there were introduced the Talbert and the Ewing bills, the former providing competition, regulation of rates, and police powers in the telephone business, and the latter for all other public utilities. The consternation of the Cumberland people and the high priests of other public service corporations was almost pathetic. For several days they were busy telling each other that such radical measures could never pass. But before there was time to plan a defense the Talbert bill had passed the senate. Then the milords of finance settled down to practical work. A "radical legislature was rushing away with things," was the word passed along, and preparations for the siege were begun. The Cumberland Telephone Company, always alert and victorious in many legislative battles, had never before faced anything quite so dangerous to its sway in Tennessee. So the wheels within its wheels were set in motion. The Nashville daily papers were promptly pressed into service to warn the people of the "outrage" about to be perpetrated on them. "The rights of local self government" were swept away by this bill, and general pestilence seemed about to fall upon the unsuspecting people if this "iniquitous" measure should become a law. The papers called for a public mass meeting to express the indignation of Nashville's citizens. As a result of their inspired screeching a lonely company of less than 300 sat in the huge auditorium, listened to much spread-eagle oratory, and even though a majority of the crowd were employes and stockholders of the Cumberland, the chairman refused to count a division on a resolution offered. This was the first boomerang. The situation was rapidly becoming desperate. The house must not be allowed to pass the Talbert bill, or in one stroke the telephone monopoly of Tennessee would be at an end. And there was "no telling what this legislature would do." Straightway the trust crowd began to lead committees of "outraged" citizens to the capitol to protest. Mayors and city councils of

Tennessee towns and cities were implored to protest against the passage of a bill that "usurped their powers." But at length the house committee on corporations recommended the bill for passage, and it was promptly brought up in the house. There ensued three hours of as strenuous procedure as that chamber has seen in many a year. Damaging amendments were offered in great number only to be voted down. At this point the Bell agents saw defeat staring them in the face, and fillibustering was resorted to with the hope of bringing adjournment, thus delaying final action until after a recess of three weeks of the legislature, which would give them time to rally their forces. However, the reform forces stood shoulder to shoulder, and a vote was forced which resulted, 52 ayes to 37 nays, and the Cumberland Telephone Company left the capitol for the first time in defeat.

Through all the preliminary skirmishing in senate, house, committee rooms, and in public meetings, never a word in favor of the Cumberland was spoken. Its most ardent supporters dared not say a word in its defense, so obnoxious had the corporation's methods become; so, with all its power the Cumberland was forced to adopt a defense in which its own name had to be tabooed, and finally brought its own defeat. The favorable vote in the house, however, did not silence the trust magnates. A particularly hard fight was then made to secure a veto of the measure. Every influence possible to be secured was used upon Governor Patterson, but to no purpose. His election having been opposed by the corporations, and free from political promises, he signed the bill that goes a long way toward bringing competition into the operation of public utilities in Tennessee.

And yet the Talbert bill is not the only blow given the Cumberland. Within two days after the signing of this act, a suit brought against the city of Nashville by the Home Company to restrain the city from interfering with it in its construction and operation of a system under a general law similar to the Talbert bill, under which the Cumberland had built into nearly every city in the state, was decided upon every point in favor of the Home.

Altogether the fight between the Cumberland Telephone Company and the Independents in Tennessee will go down as one of the most noteworthy in the history of the telephone industry, and ranking as a striking epoch in the legislation of the state.

# BELL PRESS BUREAU REBUKED

*Finance's Biassed Review of the Nichols Report Punctured in a Letter Written by*

J. B. Hoge.

TELEPHONY has received many letters from Independent telephone men calling attention to the reports sent out broadcast from the Bell press bureau. One of these reports was printed in Finance, of Cleveland, and the following letter from Mr. James B. Hoge, president of the International Independent Telephone Association, to the editor of Finance, under date of January 24, shows the reported up so baldly that it is reproduced in full. Mr. Hoge's letter follows:

"In your December 15th issue, at the top of page 762, the following appears:

SPECIAL TELEPHONE REPORT.—In his report to the New York board of estimates on the telephone situation, Engineer Nichols says that in nearly every city where an Independent telephone system has been introduced, the effect has been attended with inconvenience to all subscribers and by additional expenses. He also points out that many of the Independent companies secured their franchise by offering low rates and that afterwards it was discovered that it was impossible to make a profit at these rates.

"The general statements made are not entirely in keeping with the facts, as a perusal of the report in question will prove to you.

"On page 765 of your same issue there is a more extended review of this report, which is entirely one-sided. The whole aim of the article, apparently, is to influence your readers, who are not fully informed on the subject, against telephone competition, leading them to infer that it has been in every respect a failure, and that the result of Mr. Nichols' investigations, as set forth in his report, leaves no other conclusion possible.

"Knowing your desire for fair play and believing the readers of Finance are entitled to an impartial review of this report, we call your attention to certain important features which your reviewer seems to have overlooked.

"On page 22, under 'conclusion,' the report says:

Although the conditions which should determine this matter are alike in no two cities, and the conditions in no city are even similar to those in New York, yet to my mind these Independent companies which are now in operation throughout the country have accomplished certain desirable results.

First—They have, by a vigorous campaign, been the means of creating a new interest in the telephone business, resulting in a great increase in the number of subscribers of both Independent and Bell companies, which has been of great benefit to all users of the telephone.

Second—They have, by competition, compelled the Bell companies to give better service.

Third—They have been the direct or indirect cause of reduction in rates of the Bell companies.

The effect of the reduction of rates of the Bell companies, and the increased development caused by the Independent companies, upon the present cost of telephone service compared with that before competition, may be stated as follows:

Users of the Bell telephones only get better service and increased number of possible connections at less actual cost.

Users of both systems (number of telephones in the hands of such subscribers being, generally speaking, about fifteen per cent of the whole) get better service and increased number of possible connections, with the present actual cost, in a few cases about the same or less, and in other cases more than previous to competition.

To many subscribers of the latter class the increased number of possible connections gained by the increased number to the Bell company added to the number of subscribers to the Independent company is such value that the subscriber is thereby compensated for his additional outlay. Those of this class who are not so remunerated must, of course, carry the burden of increased cost, though I believe there are none who do not receive some benefit from the development, which, at least, partially compensates them for the increased charge. There is no doubt that all subscribers receive the benefit of the increased efficiency of service.

I am under the impression that the benefits which have been acquired as a result of the dual system of telephony were at the cost to a limited number of subscribers, who are not benefited to the extent of such increased charge.

"Do you consider Mr. Nichols' views, as set forth in the foregoing, as being altogether correctly and fairly expressed in your reviewer's statement that Engineer Nichols says that in nearly every city where an Independent telephone system has been introduced, the effect has been attended with inconvenience to all subscribers and by addtional expenses?

"On page 6, treating of Trenton, New Jersey; Philadelphia, Pennsylvania; Wilmington, Delaware, and Baltimore, Maryland, Mr. Nichols says: 'There is some difference of opinion among telephone subscribers in these cities as to just what benefits, if any, have been derived through

the institution of competition, some claiming that the growth of the Bell companies, the decrease of their rates and the improvement of their service are due largely to natural development, rather than wholly to the presence of a competitor, but the majority of telephone subscribers visited believed that all or the greater part of these results were brought about through competition.'

"It occurs to us that the subscribers themselves should be pretty good authority on this subject.

"On page 7, under the heading 'Middle West,' the report says:

Throughout the states of Indiana, Ohio and a portion of Kentucky, the Independent companies seem to be fairly established. Competition has increased the efficiency of the service of the original company and the number of telephone users. In a number of the cities, Independent companies were enabled to gain a foothold they have now because of the poor service furnished by the Bell companies, and in small places by reason of the latter's refusal to establish a plant. The only city of importance within this area which the Independents have not entered is Cincinnati, where a franchise has once been refused.

In addition to the large number of local plants controlled by them the Independents have formed long distance companies and are building through lines designed to reach all important places in these and the surrounding states.

In the state of Michigan, the Michigan Telephone Company (Bell) was, prior to 1896, the only telephone company operating. This company has not developed the territory, except in the large cities, and at that time furnished poor service. It was owing to this that the Citizen's Telephone Company (Independent) was organized by the citizens of Grand Rapids, and since that time the Independent companies have made rapid growth. Since competition has entered the field, the Bell companies have greatly developed the territory; the rates have been reduced and both companies have endeavored to furnish their subscribers with first-class service.

In St. Louis, the unsatisfactory service rendered by the Bell company prior to 1899 led to the organization of the Independent company. Since competition began a reorganization of the business management of the Bell company has taken place, and the service is now much better, and an effort is being made to develop the business. The situation in Kansas City is similar to that of St. Louis. In these cities, the plants of the Independent company are of the best equipment; the service rendered is of the highest order, and the number of subscribers has steadily increased.

"All of which would indicate that the Independent movement has more than justified its existence.

"Coming back to the subject of convenience to subscribers, and the value of an extended telephone service, on page 13, the reviewer says:

I believe 15 is a fair percentage to take as an average of duplication. It is seen therefore that the extent of the reduction in rates caused by such competition, while the smaller number, those requiring telephones, are obliged to pay two rates, which usually amount to more than that of the original company only, previous to competition.

There are subscribers, however, whose business is such that more than two lines are required in one system. He may install one line of each system, so that the business may be divided, the expense of the same being no more than the two lines of one system. Subscribers of this class though are only a small percentage of the whole.

From inquiry made it would seem that there are certain classes of business men who in a way do not consider the cost of a telephone service; to them the main feature is the number of people who may be reached or who may reach them by means of the telephone; in other words, the development of the use of the telephone. To all men in business this matter of development is desirable. To the merchant, however, it is most desirable, as it enables him to do business by means of the telephone which he would otherwise lose. To the large merchant the increased cost of the two systems over the one system is insignificant compared with the increased business gained if competition has caused large development. Increase in the number of subscribers, is, no doubt, of great value to the man in business, and if this increase is brought about by an Independent telephone system, he is hereby, to some extent, at least, compensated for his additional expense. It will be necessary to discuss under separate headings the effect of competition on rates and growth of the telephone. In these discussions I shall show that competition has caused the rates of the Bell companies to be reduced, and also has caused an enormous growth in the number of telephones.

The following appears on page 14, under the heading "Growth and Development of the Use of the Telephone":

Previous to installation and operation of competing telephone systems the Bell companies, may, at least, appear to be extremely indifferent to the matter of development. They confined their operations to cities, and put forth little effort to develop smaller places, unless it was foreseen that good return upon the money invested was to be earned. By reason of this method of procedure the telephone was scarcely known to those outside of cities and large towns. The operation of the Independent companies has changed the attitude of the Bell companies to a great extent. The Independent companies began operations in small towns and spread to larger cities, until at present in the states of Indiana, Illinois and Michigan, and other localities, there is scarcely a town which has not an Independent local and long distance telephone. All the principal cities in New York state, with the exception of New York City, have Independent telephone systems, and there are in operation hundreds of farmer lines in the state.

The effect of competition upon the Bell companies has been to create a new ambition on their part to enlarge and develop their system. The result is that at present both the Bell and Independent companies are rapidly increasing their number of subscribers.

This all means that the Independent companies, by their energy to get new business have inspired the Bell companies to make effort to also increase the number of their subscribers, that they may successfully compete with the Independent companies, resulting in an enormous growth, which has been of benefit to all users of the telephone.

"Taking up the effective competition on Bell rates on page 15, Mr. Nichols enumerates some of the ways in which Bell rates could be reduced without making the fact public, stating that cases similar to those were found at various places. After considering the denials of the Bell officers that rates have not been reduced through competition, he says:

Notwithstanding the statement which is generally made by the Bell companies representatives, that competition had no effect, about the time when competition appeared, or was feared, as in New York City, or when the Independent companies gained sufficient strength to become dangerous competitors, a few representatives of the Bell companies have reluctantly admitted that the Independent companies have had the effect of causing such reduction in rates. My own opinion upon this matter is that the Bell companies have made reductions from time to time because of competition or the fear of it. Even if some of the reduction were made because the earnings of the company were large, I believe the subscribers were more sure of getting this advantage because of competition with the Independents.

If the increased earnings of the Bell companies which has enabled them to make the reductions has been caused by a large increase in the number of subscribers, even then the Independent companies have been indirectly the cause of the rate reductions and I have previously shown that the Independent companies have been, in a measure, responsible for the rapid growth in the number of subscribers of the Bell companies.

Mr. Nichols has the following to say on page 16 regarding "Effect of Competition on Efficiency of Service":

Many subscribers state they are in favor of the Independent companies for the reason that competition has caused the Bell companies to give better local service. Previous to the coming of the Independent companies, little attention was paid to the complaints of subscribers, little development of the system was attempted and the service rendered was in many places unbearable. Since competition, money has been spent freely by the Bell companies to install better apparatus, and better discipline of employes has been maintained, with the result that the standard of efficiency of the service has been raised.

To the unprejudiced it must appear that Mr. Nichols found a great deal to be commended in telephone competition and we submit the foregoing extracts from his report for the consideration of yourself and readers."

---

## *BERKELEY GRANTS INDEPENDENT FRANCHISE.*

After a spirited bidding contest the Home Telephone Company secured a franchise giving it the right to operate at Berkeley, California, for which the sum of $47,000 was paid as public compensation. The city will devote the money to equip its fire department. The Bell forces tried to prevent the Home company from obtaining the franchise and the bidding between the conflicting interests was lively. The bids started at $25,000, were raised to $27,000, then $35,000 and so on by jumps of ten per cent until the representatives of the Home offered $47,000, when the opposition retired from the contest.

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# EDITORIAL DEPARTMENT

## *INDEPENDENT PROSPECTS BRIGHT.*

GREAT as was the success and development of the Independent telephone movement throughout the United States in 1906, the indications are that the current year will eclipse even that wonderful record. More capital is being invested in the telephone business than ever before, and the field is being developed at a rapid rate. The Independents now have plants or are building plants in every important city in the west with the exception of Cincinnati. In the east they either have systems or have obtained franchise rights preliminary to building plants in every large city excepting New York, Providence and Washington. In Providence and New York the question of giving the Independents a franchise is being agitated vigorously, the people showing unmistakable signs of being heartily tired of the Bell monopoly, and the prospects are bright that competition will come sooner or later. The Independent victory in Boston has had a wonderfully stimulating effect on the anti-monopolists in the telephone field in all the eastern cities. Throughout New England, especially, the sentiment in favor of the Independents is growing, and they are outstripping the Bell companies in many localities. Defeat of the monopoly in its stronghold, Boston, has given a strong impetus to the opposition in Maine, New Hampshire, Vermont and Connecticut. A similar feeling is spreading all over the country, confirming and strengthening the belief that the Independent telephone movement is entering upon the most prosperous era of its history.

## *A BELL CALAMITY HOWL.*

IN its desperate efforts to discredit the Independent telephone movement the Bell publicity bureau overreaches itself every once in a while. A glaring example of this excessive zeal to block the growth of a competitor is found in a recent issue of the Louisville Courier-Journal, which printed three columns of Bell argument which was chiefly characterized by prejudice and unfairness—as is usually the case with the monopoly's propaganda. The article, which, of course, was prepared by Bell hands, began with a fulsome compliment to the Bell financial policy, continued with a savage attack on the Independent methods, and concluded with a list of failures, receiverships and sales attributed to non-Bell telephone companies. In compiling this list the Bell's "calamity howler" has raked and scraped over the last four years and seized upon every possible instance that could be twisted and distorted into the semblance of a black eye for the Independent movement. All told there are something like ninety of such cases cited, and the Bell publicity bureau dilates on them, attempting to prove that the complete downfall of the Independent structure is but a question of a few hours.

Of course this is the veriest nonsense—and vicious nonsense at that. There are upwards of 12,000 Independent telephone companies in the United States, and the list of alleged failures gleefully paraded by the Bell—even granting all are correct—shows up ridiculously small compared to the total number, an overwhelming percentage of which are not only prospering but giving the Bell a spirited contest in their respective localities. As a matter of fact, the proportion of failures among Independent companies is much smaller than the failures among concerns in other lines of business. The statement has been made that statistics show a smaller percentage of failures among Independent telephone companies than among national banks, and that statement has never been disproved, and national banks, it should be remembered, are under the supervision of federal examiners who are supposed to prevent failures and make suspensions unnecessary. Mistakes are made in every line of business, and it is inevitable that in all branches of commercial enterprise depending on human agency there will be errors of judgment more or less serious, but the contention is made with good authority that the Independent telephone field contains fewer failures

## TABLE OF CONTENTS

Telephone Story of Ohio.....Frank L. Beam 145-153
Hints to Technical Writers.....H. P. Clausen 154-155
Practical Suggestions.....R. H. Manson 156-159
Decisions Affecting Telephony.....G. W. Hand 160-161
Modern Toll Switchboard Equipment.....
.....J. E. Hilbish, J. B. Thiess and G. A. Joy 162-166
Lightning—Its Peculiarities.....A. E. Dobbs 167-168
Texas Independents Prosper.....E. M. Rothelle 168-169
Digest of Telephone Patents.....E. E. Clement 170-171
Arkansas Telephone Convention.....R. A. Warner 172-173
Telephony in Railway Service.....C. J. H. Woodbury 174-176
Model Telephone Exchange.....E. M. McMeal 176-177
Bell Trust Beaten in Tennessee.....H. D. Cranfield 178-180
Bell Press Bureau Rebuked.....J. B. Hoge 180-181
Editorial Mention.....H. B. McMeal and H. D. Fargo 182-187
Polechanger Connections.....W. A. Woods 187
Time and the Telephone.....E. E. Flora 188-190
Description of Blake Signals.....E. J. Burke 190-191
Manufacturers' Department.....W. H. Graffis 192-209
Rural Line Districts.....O. H. Brandenburg 210

than most other lines of industry. Financial men not owned body and soul by Bell interests admit this, and are manifesting their confidence in Independent securities more and more every day. They have learned not to be frightened by the clamor of the Bell "knockers," whose statements, such as that noted in the Louisville paper, should be received with an exceptionally large amount of salt.

Independent telephone men usually are too busy attending to their growing industry to take much notice of the frenzied efforts of the Bell to discredit their enterprises, but, as has been said, every so often the Bell press bureau produces so rank and flagrant an assault that a retort is required. The Louisville outburst is a case in point, and it is branded—as it deserves to be—a misleading and grossly unfair attack. The same logic would convict every other business of insolvency, for it is possible to tabulate failures in all branches. Citation of isolated cases is a threadbare trick of individuals who for the best of reasons do not care to refer to the large bulk of cases that prove the contrary to their contention.

### *THE TELEPHONE AND FARM VALUES.*

IN anticipating the benefits to be derived from the growth of Independent telephony in the Dominion, our Canadian friends expect that the movement will increase the price of their farm lands. While there are several reasons why farm lands in the United States bring more money than similar holdings in Canada, the Dominion press is preaching that, when the Independents have established more rural lines there, farms will become more valuable and that conditions in the States will be duplicated across the border. Farmers in this country know that the rural telephone lines have made life more comfortable, lightened their burdens and facilitated their business of growing, harvesting and selling crops. As a natural result the value of their farms has increased. The Canadian tillers of the soil have a right to expect the same benefits, and for that reason are working diligently to develop Independent growth in the provinces.

No stronger proof of the great advantage the rural telephone is to the farmer has been presented than the recent instance in the cotton-growing states. Cotton experienced a sharp advance in price and the planters who had telephones in their homes received the information in time to act on the rise and secure a neat profit. Those who had no telephone were unable to get in on the ground floor and lost enough money to pay several years' telephone rental.

### *THE SHOE ON THE OTHER FOOT.*

IT HAS always been a favorite line of attack for the Bell monopoly to scoff at the securities of Independent telephone companies. First, the agents of the octopus—in the press and in Wall street—have spread broadcast the report that Independent stocks and bonds were a drug on the market. Then, when they were sold, the Bell agents argued that the investors in Independent securities were dupes and victims who would soon regret their action. In the light of these facts, it is interesting to note that the Bell is getting a dose of its own medicine. Its latest bond issue of $40,000,000 is moving so slowly—even with the backing of the big financiers, led by J. Pierpont Morgan—that if a similar delay marked the sale of Independent securities the Bell spokesmen would consider themselves justified in predicting the immediate downfall of the entire Independent structure. To be plain about it, the bond issue of the American Telephone and Telegraph Company seems to be a "frost."

In order to throw dust in the eyes of the investing public, the Bell people are industriously pointing the finger of scorn at Independent securities, hoping thereby to distract attention from their own troubles. Also, by prophesying the downfall of the Independent movement, the Bell agents hope to induce financial men to look with more favor on the Bell securities, especially the $40,000,000 bond issue that seems to be lagging behind. Particularly in Boston, where the Independents dealt the monopoly a body blow, has the Bell been trying to discredit the Independent movement. These tactics, however, instead of driving anybody to cover, have led to sharp reprisals, and there have been retorts calculated to convince the Bell that, living in a glass apartment, it was poor policy to throw stones or raise an issue about telephone securities.

Mr. Vinton A. Sears, of Boston, has made a statement that constitutes a severe indictment of the Bell. At least, it certainly shows that the monopoly has no business criticising the salability and productiveness of other companies' securities.

"The Bell Telephone Company is very solicitous about the strength and development of its companies and the failures of the Independent companies," said Mr. Sears, "but if you look up the past record and past history of the Bell companies and the Independent companies, you will not find any medals either at No. 121 Milk street or at No. 119 Milk street, because the records will show you, if you go back to the period when competition begun, that the stock and bonds of over ninety per cent of the Bell companies have depreciated in value from year to year until during the past five years they have depreciated in value to the extent of not less than fifty millions of dollars.

"It is no wonder that Mr. Fish called the Boston investors provincial because he could not sell them further stocks and bonds in order to carry on the warfare against the Independent companies and against the public needs. The New England investors may consider themselves wise in being provincial because when stocks depreciate in value to the extent they have in the American Telephone & Telegraph Company and its sub-license companies, it would make any investor sit up and take notice.

"After discounting and rediscounting their bonds and notes they were able to underwrite them outside of provincial New England at a rate whereby their last notes cost them over eleven per cent. This was something new for the Bell Telephone Company, because it was used to putting out securities on the basis of four and five per cent and have them over-subscribed, and when it gets to the point where its money costs over eleven per cent, which was publicly printed by the New York Sun, on the morning of January 12, it has certainly come to a pretty pass.

"Bell companies are spending thousands and millions of dollars of New England money and any other money they can get hold of, to try and convince the public, especially the investing public, that they are the only companies in existence that can give modern telephone service, and also that the Independent securities are not a good investment, and that anyone who goes into them will lose his money.

"The Bell Telephone Company, through its paid press agents, will go on to state as to the failure of this and that Independent company, but forgets to say anything about the failures of the sub-licensees of the Bell Telephone Company or the depreciation of the securities of the parent company. If all the failures of the Independent telephone companies were put together they would not amount to one-twentieth part of the depreciation of the value of the securities of the parent Bell Telephone Company and its sub-licensees. As a matter of fact, all the Independent failures put together would not amount to as much as the failure of any one of the Bell sub-licensees, and several of them have failed.

"The Hudson River Bell Telephone Company is another example going in the same direction. If any stockholder in Boston owns any Hudson River stock he knows that the stock has not got anywhere near the value it had prior to competition.

"The Bell company at this time needs all the support it can possibly get, both paid and otherwise, in order to help the underwriters get rid of their unmarketable and unsalable bonds, and the underwriters' methods of handling this matter is very wise, because they are putting them out in such a way that the general public will never know whether one-third, one-fourth, one-fifth or what amount was sold. I suppose they will simply close the books and come out and say they were oversubscribed, because that would be the only safe way to handle the matter in order to unload them on the public later.

"The Bell Telephone Company and its officials say that there is nothing to Independent telephony, and that it does not amount to anything. That being the fact, it seems very strange that they should spend thousands and millions of dollars each year in trying to prevent competition in different localities and it also seems strange that they have not been able to stem the tide of competition in spite of all the money they have expended in that way.

"During the past year Independent franchises have been granted in such cities as San Francisco and Oakland, California; Portland, Oregon; Tacoma and Bellingham, Washington; Omaha, Nebraska; Denver, Colorado; Boston, and hundreds of other cities and towns of less importance, and it is a fact that there is scarcely a single large city in the United States to-day that has not granted an Independent franchise, with the exception of New York City, and plans are well under way there to secure competition, so that the entire United States will be covered within a very short time. The Bell company in its present financial condition is not able to stem the tide, because the public is against it and it is bound to go down to defeat."

Boston and the entire eastern country are just awakening to the fact that the stories circulated by the Bell derogatory to Independent companies in other parts of the United States are shamefully misleading. For instance, reports criticising Ohio Independent companies are spread in Maine, California and other distant states. At home the Independent companies stand high. It is the policy of the Bell, however, to attack them viciously in other sections of the country where competition is threatend. Speaking of this sort of warfare recently, Frederick S. Dickinson, of Cleveland, said:

"The Cuyahoga Telephone Company has never been attacked in Cleveland (the field of its operations), but in Bangor, Maine, pamphlets criticizing it unfavorably have been distributed in the doorways by the hundreds.

"Only the other day a telegram from Boston was solemnly read before a committee of counsel in San Francisco, whose duty it was to pass upon a proposed opposition telephone franchise, and the telegram asserted that the Cuyahoga Telephone Company was about to pass into the hands of a receiver.

"How strange, to go to Boston for information about Cleveland! Cleveland's answer to Boston news must have convinced the city fathers of San Francisco that all the people in both the towns could not be truthful."

This scheme of the Bell, to quote the alleged disastrous experiences of Independent companies before legislative bodies far remote from the concerns criticized, is being worked daily, but its effect is dying out and justly so. The public is becoming wise.

## *AN IMPORTANT BULLETIN.*

THERE have been so many inquiries regarding the proposed transfer of the United States Independent Telephone Company of Rochester, that the International Association has issued a special bulletin dealing with the matter in detail. As usual, the Bell agents have endeavored to make capital out of the agitation and seized upon the opportunity to disseminate all sorts of rumors calculated to injure the Independent movement. The association bulletin therefore is of special interest. It follows:

"To the Independent Telephone Interests of the United States and Canada:—

"The press of the country has paid more than usual attention to the proposed sale of the United States Independent Telephone Company of Rochester, New York, and its subsidiary companies, comprising the Stromberg-Carlson Telephone Manufacturing Company, the Independent telephone companies operating exchanges at Rochester, Syracuse, Utica, Jamestown, Rome, and some smaller places in New York state, and the control of the Utah Independent Telephone System.

"A meeting of representatives of most of the larger Independent telephone interests of the country was held at Cleveland on February 18, under the auspices of the International Independent Telephone Association, for the purpose of formulating a proposition having in view the acquisition of the securities and property of the United States Independent Telephone Company, of Rochester, New York.

"The president of the International association was delegated to request Mr. H. P. Brewster, chairman of the advisory committee in charge of the affairs of the United States Independent Telephone Company, to furnish statements showing the financial condition of the company's properties, and to afford facilities for verifying same, in order that a definite proposition could be submitted. Such statements had been previously refused representatives of the Independent interests, although freely furnished to the Bell. In reply to his request the president was informed that Mr. Brewster was absent from Rochester, and that no proposition of any kind could be entertained until March first, on which date the option of the present negotiators (the Bell company) will expire.

"It is well understood that certain individuals connected with the United States Independent Telephone Company, actuated by motives of personal interest, are favoring the transfer of the said company's securities and properties to the Bell company, in spite of the fact that among the rank and file of the bond and stockholders there are many who are anxious to save the properties from the clutches of the Bell monopoly.

"The latter class of investors, whose property rights are jeopardized by the proposed deal with the Bell company, have long viewed the mismanagement of the United States Independent Telephone Company with serious alarm, and would at any stage of the proceedings have been glad to support a plan having in view the preservation of the company as an Independent organization, had they been given an opportunity to record their sentiments.

"It is also an indisputable fact that the people of the various towns in which the United States Independent Telephone Company operates exchanges were almost unanimous in imploring the help of the Independents to save the situation and relieve them of the danger of being again subjected to the cupidity and arrogance of the Bell monopoly.

"That the present executive management of the United States Independent Telephone Company has been the subject of merited censure is a fact known to all telephone men, and the shrinkage in the value of the company's securities has been a matter of general comment and a hardship to honest investors. In view of these facts, it is not strange that these men do not care to entertain any legitimate proposition coming from an Independent source, which would mean that the affairs of the company as administered by them would be given a thorough investigation.

"Considered from a purely business point of view, it seems incomprehensible that the Bell company should seek to secure control of the United States Independent exchanges in the face of its bitter experiences in the state of Michigan; in Toledo, Ohio; South Bend, Indiana; Portland,

Oregon, and in many other places where Independent companies are flourishing in spite of the millions spent by the monopoly in vain efforts to throttle competition. It should be borne in mind that the people have steadfastly refused to submit to the proposition of the monopoly owning and operating the only telephone system from which they could obtain service and Independent competition is being recognized more and more by the public as the only practical method of securing anything like adequate telephone facilities with equitable rates and proper treatment of patrons.

"The principal properties in New York state which would be affected by the proposed transfer of the United States Independent Telephone securities, are operating under franchises which prohibit them from being sold to the Bell telephone company, and in the event of the sale this is likely to lead to lengthy legal proceedings. Already the local people in the various places that may be effected by the proposed sale of the United States Independent properties are preparing to take advantage, if this sale is made, of the strong Independent sentiment to secure new franchises and build modern exchanges to be operated in conjunction with the Independent system, which would finally result in the Bell telephone company receiving only the wreck value of these properties.

"It should be understood that the United States Independent Telephone Company of Rochester has no connection whatever with the United States Telephone Company of Ohio, the United States Long Distance T. & T. Company of California, the United T. & T. Company of Pennsylvania, or other companies of similar names. None of these companies will be effected by the proposed 'absorption' of the United States Independent Telephone Company of Rochester, New York, and there is no foundation whatever for the claim made that this 'absorption' would carry with it the control of the Kinlock Telephone Company of St. Louis, Missouri; the Consolidated, Frontier or Interocean Companies of Buffalo, New York; the Independent system with headquarters at Albany, New York, or the Indianapolis Telephone Company and the New Long Distance Company of Indianapolis, Indiana.

"The United States Independent Telephone Company of Rochester holds only 25 per cent of the securities of the Indianapolis company, and arrangements have already been completed to keep the control of this organization strictly Independent. The United States Independent Telephone Company has no holdings of any sort in any other operating or manufacturing company beyond those specifically mentioned in the opening paragraph, and none of the companies just enumerated are considering or will consider any sale of their properties to the Bell.

"Should the Bell company, with the assistance of the advisory committee of the United States Independent Telephone Company, succeed in securing control of the operating companies connected with that organization, it would mean a temporary loss of only 25,000 telephones, which is just about two-thirds of one per cent of the Independent telephones in the United States.

"A transfer to the Bell monopoly would undoubtedly work a hardship on the patrons of the exchanges involved in the transaction, but only until competing systems could be installed, and it is safe to assume by that time the Bell's investment in those exchanges would have become a total loss as it has at other places.

"It must not be lost sight of that during the past year the Independent telephone interests have been successful in gaining a foothold in more than sixty per cent of the cities and villages that had not previously enjoyed Independent telephone service, the most important of these towns being Boston, Massachusetts; Chicago, Illinois; Denver, Colorado; Omaha, Nebraska, and Milwaukee, Wisconsin. During the same period a new Independent manufacturing plant has been completed, and a number of other Independent manufacturers have increased their facilities for taking care of the growth of the Indepndent companies, so that the proposed sale of the Stromberg-Carlson manufacturing plant if consummated will not embarrass any of the Independent operating companies in securing their apparatus, since no difficulty will be experienced by other manufacturers in making necessary extensions to existing plants and furnishing additional equipment as required.

"The gentlemen who attended the Cleveland conference represented Independent telephone investments amounting to over $78,000,000, and are prepared to make any reasonable offer to keep the United States Independent properties from passing to the Bell monopoly, although they feel that this sale would not materially injure the Independent companies. They realize that the Independent movement is strong because every Independent exchange is a public protest against monopolistic aggression, and every dollar paid in interest on Independent securities goes back to the people. So long as this state of affairs prevails, there is no danger that the Independent movement will be injured by the defection of any one company or organization."

## *TELEPHONE COMPETITION.*

THE subject of telephone competition is one which arouses considerable interest. It is something of which the general public is inclined to take a very superficial view, especially in the localities where the long established Bell interests are so far unmolested, and have had the voice of the press to mold public opinion against telephone competition by means of the old and specious arguments in favor of "natural monopolies," says the El Paso (Texas) Herald. Attacking the most susceptible side of the average business man, they advance the proposition that "two telephone systems in a town are a nuisance."

Now a busy man has no time for nuisances, and he accepts this argument and believes it. Next they attack his pocketbook and say, "Two telephone systems cost twice as much as one." He believes that, too. And that is about all they have in the way of argument, but by ringing the various changes upon it they can convince the superficial thinker, or the man who hasn't time to go deeply into the question, that they are right. But reason and fairness dictate that we should go more deeply into the question. It is an economic axiom that the effect of legitimate competition in any line of business is a better product at lower prices. This rule obtains in the telephone business as well as in any other. There is no reason why the telephone business more than any other should be considered a natural monopoly.

It stands to reason that two telephone companies in any town would have to stand or fall on two things—the quality of service that they render and the rates they charge for it.

When a Bell company has a monopoly of the telephone service in any town it invariably gives no better service than it is actually obliged to give, and it charges the subscriber all that it can possibly get. The moment that a competing company enters the field, with first-class service, and charges reasonable rates, the Bell company is obliged by the force of competition to better its service and to reduce its rates.

Just as long as the competing company continues to give good service at reasonable rates, just so long are the subscribers of both companies assured that such conditions will continue to prevail, for the Independent or competing company usually sets the pace in the matter of quality of service and the amount of the rates.

In nearly every case where an Independent company has invaded Bell territory, the Bell people have been obliged to reduce their rates materially and improve their service.

The advent of the Independent company and the keen

competition that usually ensues, always results in a very great increase in the number of telephones used, and this, in connection with the reduced rates, makes it possible for a person to have both telephones for about the same or very little more than he formerly paid for one, with a very greatly increased list of telephone connections at his command.

When public service corporations give decent service at a reasonable price, without the use of the prod of competition, competition will die for lack of sustenance, and the company giving the most satisfactory service will be retained by the public.

But, until then, competition should be encouraged as the best and most natural and forceful stimulus to good public service of any sort. It is a natural conclusion that the fittest will survive.

Far from being in any way an evil, or even a disadvantage, two telephone systems in any municipality are a source of good. They make for cheaper rates, better service and continued effort toward improvement just as surely as does monopoly make for high rates, bad service and stagnation.

One writer upon this subject of telephone competition says: "Let us suppose that two telephone systems are installed. It simply means that you pay practically as much for two telephones as you would for one if the Bell controlled the field. We are sure that because of the fact that one railroad entered a town, we would not drive another away if it sought the privilege of passing through.

"We would not hinder a second express company from coming into our midst, nor would we hold out the Postal Telegraph Company in competition with the Western Union. One grocery store might satisfy us; but we really prefer the annoyance of two, because of better goods at lower prices.

"Competition in all lines reduces cost to the consumer, and if it makes talk cheaper, the inconvenience of two telephones is more imaginary than real."

Two telephone systems in a town are a guarantee of low rates, of good service, and a continuation of these blessings, and an insurance against the opposite. So much for the advantages to all the subscribers. The advantages to all are the advantages to each one. Every subscriber having two telephones is assured of telephone service in the event of either getting out of order. And he may be sure that the repair man will find him more quickly than if he were depending upon a single company. The business man who thinks a dual system a nuisance surely has looked upon but one side of the question. To him two systems, far from being a nuisance, really mean a wider range of telephonic influence and assurance of the best service at reasonable rates.

The beneficent effects of telephone competition may be seen in more than 5,000 cities and towns in the United States, where Independent telephone companies have exchanges operating in competition with the local Bell companies. In every one of these cities where the Independent exchange has modern equipment and good business management, it is a success. It gives a quality of service surpassing that of the earlier occupant of the field, and at a lower rate, and in addition shows an interest in pleasing its patrons and giving them courteous treatment that is novel to them.

## *MICHIGAN TELEPHONE CONVENTION.*

The annual convention of the Michigan Independent Telephone Association will be held at Coldwater, Michigan, March 7 and 8. An unusually interesting programme for the two days' meeting has been prepared by the committee in charge. When the delegates convene at the Armory Hall, Thursday afternoon, G. E. Kleindinst, mayor of Coldwater, will give the address of welcome, and E. B. Fisher, of Grand Rapids, president of the State Association, will respond and deliver his annual report. Reports will follow from William Robinson, of Muskegon, the treasurer, and J. B. Ware, of Grand Rapids, the secretary. The appointment of the standing committees will be made, after which several convention papers will be read. H. T. Clough, manager of the Owosso Exchange, will discuss "Improving Toll Line Service." W. S. Vivian, of the Grand Rapids exchange, will speak on "State Traffic Association;" C. O. Trask, of Saginaw, on "Changed Conditions," and Fred C. Hughes, manager of the Lansing exchange, on "Telephone Patrons." C. H. Hood, of the contract department of the Home Telephone Company, of Detroit, will read a paper on "Getting Business;" N. F. Wing, president of the Farmers' Telephone Company, of Jackson, will discuss "Manitoba Experiences," and F. V. Newman, of Grand Rapids, will speak of the State Managers' Association. H. A. Price, general manager of the Saginaw Valley Telephone Company, of Bay City, will speak on the topic, "Michigan's Thumb."

At the afternoon session the State Traffic Association will hold its annual meeting, and the executive committee of the Michigan State Telephone Managers' Association will meet. Thursday evening the convention will listen to reports from the following leading Independent companies:

Ann Arbor Home Telephone Company, C. R. King, general manager.

Adrian Telephone Company, W. O. Hunt, vice-president.

Benzie County Telephone Company, W. A. Young, president and general manager.

Detroit Home Telephone Company, W. B. Woodbury, general manager.

Livingston Home Telephone Company, R. B. McPherson, president.

Southern Michigan Telephone Company, A. C. Himebaugh, president.

Saginaw Valley Telephone Company, F. M. Howard, auditor.

Union Telephone Company, W. J. Melchers, general manager.

Swaverly Telephone Company, C. W. Swaverly, general manager.

Muskegon Citizens' Telephone Company, William Robinson, manager.

Grand Rapids Citizens' Telephone Company, C. E. Tarte, general manager.

On Friday, the morning session will open with an address by James B. Hoge, of Cleveland, president of the International Independent Telephone Association, on the work of the organization. Frank L. Beam, president of the Ohio Association, is down for a talk on "Neighborly Greetings." and other visitors will be called upon for remarks on their respective states. C. E. Tarte, of Grand Rapids, general manager of the Citizens' Telephone Company, will speak on "Our Duty to the International Association;" A. B. Fishback, of Howell, manager of the Livingston Home Telephone Company, will discuss "Our Rural Friends." Thomas Bromley, Jr., of Hart, general manager of the Lake Shore Telephone Company, will read a paper on "Important Lessons in Rural Service." Theodore Thorward, president of the South Bend (Indiana) Home Telephone Company, on "Chicago Connections," and J. B. Ware on "Conditions in the Northwest." At the afternoon session reports of committees, unfinished business and election of officers will be the order of proceedings.

The officers of the Michigan Association are:

President—E. B. Fisher, Grand Rapids.

Secretary—J. B. Ware, Grand Rapids.

Treasurer—William Robinson, Muskegon.

Executive Committee—E. B. Fisher, J. B. Ware, W. B. Woodbury, C. E. Tarte and N. F. Wing.

Vice-presidents—First district, R. B. McPherson, How-

ell; second, R. C. Smith, Homer; third, A. C. Himebaugh, Burr Oak; fourth, J. H. Fildew, St. Johns; fifth, C. W. Swaverly, Kalkaska; sixth, H. A. Price, Saginaw.

## *WISCONSIN ADJOURNED MEETING.*

Secretary W. F. Goodrich has issued a call stating that the adjourned annual meeting of the Independent Telephone Association of Wisconsin will be held at Madison, March 7 and 8, 1907, at which time will be perfected the organization of district associations, as auxiliaries to the state association, as in Ohio, Indiana, Michigan and other states. At the previous meeting held January 17 and 18, committees on district organization, clearing house, nomination and membership were elected by the delegates, and representatives from each congressional district have organized in each of their respective districts, so that a complete organization as perfected will assemble March 7 and 8 for the completion of important details relative to the building of long-distance trunk lines by the Independent Long-Distance Telephone Company of Wisconsin, the compilation of statistics and the election of officers for the coming year.

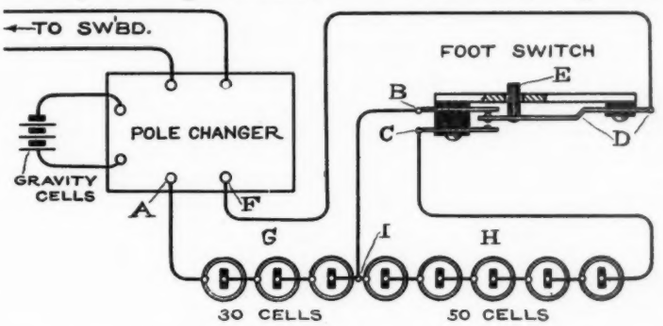
Each district is instructed and requested to bring a map or sketch of the district, showing all Independent lines and the number of telephone users, so that a comprehensive system of toll lines may be established at once. With the prospects of an early spring, this meeting will mark the beginning of important developments in the Independent field in Wisconsin.

## *POLE CHANGER CONNECTIONS.*

W. A. WOODS.

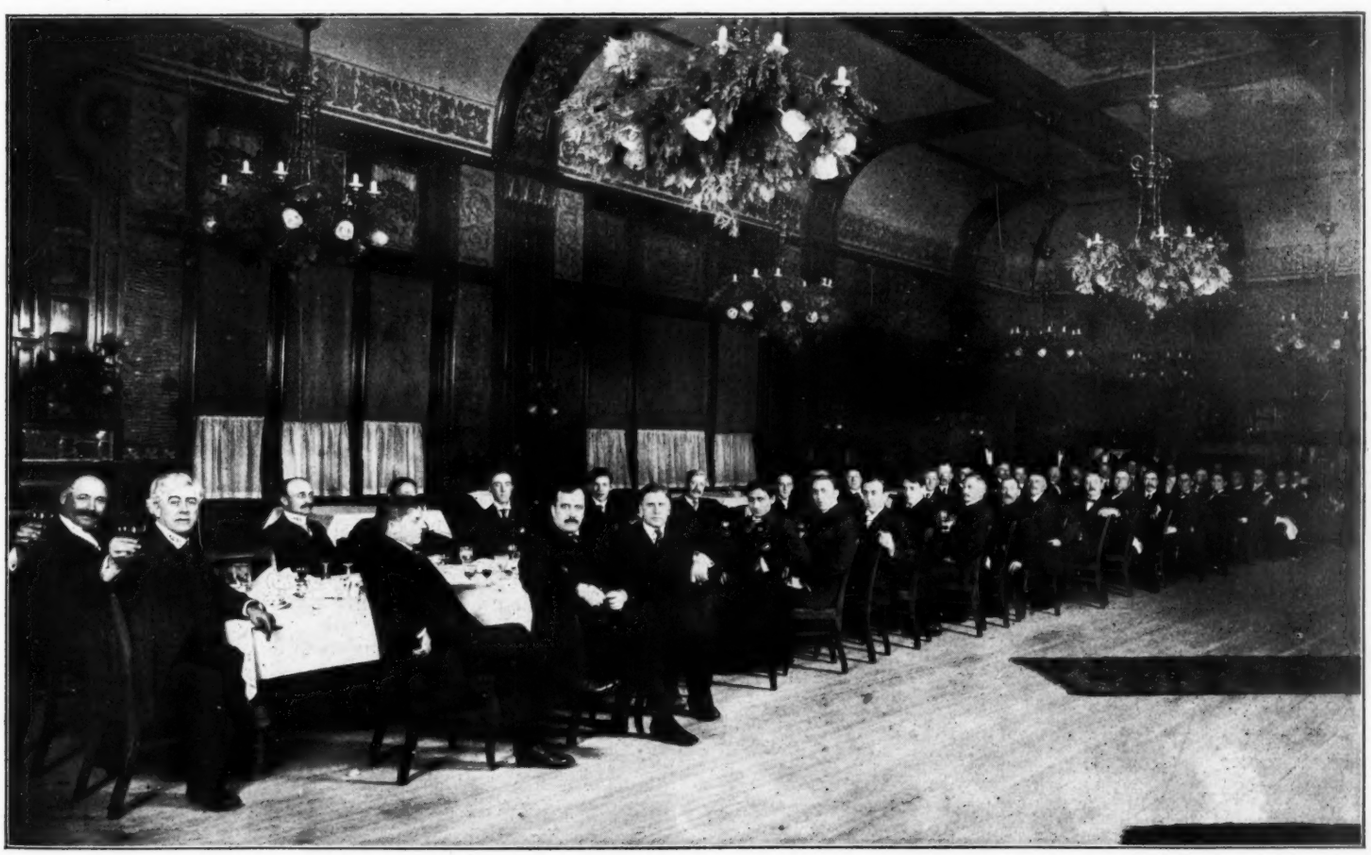
In exchanges where interconnecting service must be given to local exchange telephones, as well as toll and farmers' lines, the matter of providing a suitable ringing power is one of considerable importance. Whenever pole changers are used, the current required for operating the bells of the local telephones need not be as powerful as that required for signaling telephones connected to long lines having many telephones connected to the circuits. In most cases it is found that thirty dry batteries when connected to a pole changer give sufficiently satisfactory current for signaling the local exchange telephone, while when signaling out over longer lines additional batteries must be connected in the circuit. This may be accomplished as shown by diagram.

The pole changer vibrator, it will be observed, is operated




from a set of gravity batteries, and the primary source of power is obtained from a set of dry batteries. Normally the thirty cells of dry batteries shown by *G* are left connected onto the pole changer through the foot switch, or any other switching device. Thus, under normal conditions, the local telephones may be signaled at a minimum expense for current.

Now when it is necessary to signal out over a long line, a suitable manipulation of the switching device connects the additional fifty cells shown by *H*, so that a large quantity of current immediately becomes available for signaling over long lines. This arrangement has been shown to give very satisfactory results.



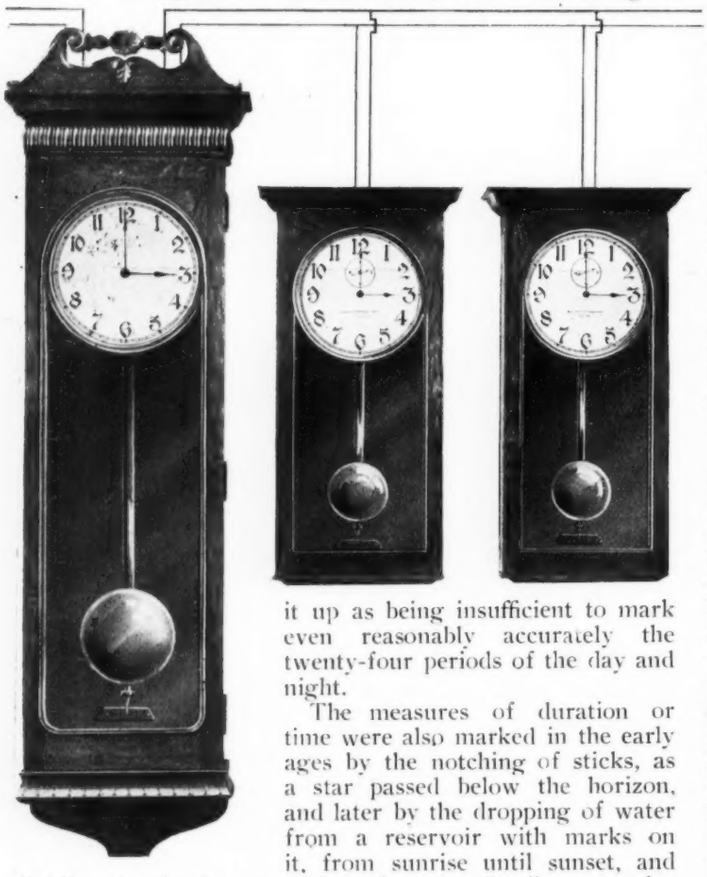
**Banquet of the Northwestern Cedarmen's Association at Duluth, Minnesota, January 8, 1907.**

# TIME AND THE TELEPHONE

*A Technical Description of the Synchronizing of Clocks over Telephone Wires*

By E. E. Flora

WHAT is time or rather what is meant by the word "time"? The simple definition of time is "duration set out by measures." Time is personified as an old man, bald headed, but having a forelock, and carrying a scythe and an hour glass. The scythe evidently is intended to represent an implement with which to reap his harvest of death, but to our modern, and one might say, more savage methods of warfare, the harvest is certainly greater and takes less time. Old Father Time's hour glass seems to be the only thing necessary to make the man with the scythe the symbol of "duration set out by measures," but why? Surely the "man with the hoe" would be more indicative of the lapse of time, for does he not begin his labors and end them with a certain period of time? The hour glass undoubtedly was used by the ancients to mark progress of the day, but even in the early histories of time measures the hour glass was not infallible, for the ancients gave



it up as being insufficient to mark even reasonably accurately the twenty-four periods of the day and night.

The measures of duration or time were also marked in the early ages by the notching of sticks, as a star passed below the horizon, and later by the dropping of water from a reservoir with marks on it, from sunrise until sunset, and dividing the day into a number of parts. Candles were also used to measure the length of day and night, and finally a real clock run by water dropping on paddles, fastened to a wheel, was devised, but this, too, became obsolete.

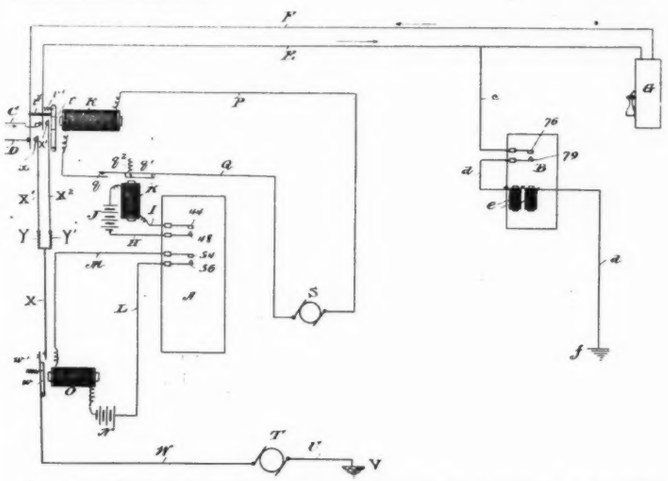
Clocks are legion, but, above all, the one Old Sol would prefer for his followers is the electric clock, made by the American Clock Company of Chicago. The master clock beats the perfect time, year in and out, and the little secondary is always obedient to its master, and for masterly action and workmanship these clocks are said to have no equal. The invention of the electric clock dates back some forty odd years ago. The real inventor's name seems to have been lost to electrical history, but it is safe to conclude that many inventions were made in this line, as in the '60's electricity was beginning to find its place in the mechanical arts, outgrowing its laboratory garb and, as clock makers were naturally skilled in delicate mechanism, it was only natural that they would early attempt its application to clock movements. It was thought at one time, that the permanent magnet could be used, if only an insulator to magnetism could be found, and in that day it was considered only a question of time until such an insulator could be invented, but to this day no such insulator has been discovered. If it could be, then perpetual motion would become a reality.

In an old journal printed in 1869 mention was made of an electrical clock used in the rotunda of the Merchants' Exchange of Philadelphia. This was simply a pan of solanoids, attracting a bar magnet, said coils being alternately cut in and out by a small slide operated by the pendulum. This clock ran for some years, but was finally abandoned as it was almost impossible to regulate it for correct time, and the advance was slow; but recently the American Clock Company has developed an excellent electric timepiece which is extremely simple and requires a minimum amount of current to operate. Unlike the early electric clocks, the current is used to elevate weights at certain periods, and these weights by action of gravity cause the train of wheels to move with perfect regularity. The next step was to secure a perfect secondary dial or clock that could be operated synchronously by the master clock. This was finally accomplished, and the company now has numbers of these clocks in operation which by an ingenious invention are not only operated from a central station, but are also set or synchronized once in a stated period of time as may be desired.

In connection with these clocks an electric time stamp has been perfected and is now in use throughout the country. It is a handsome device and is adapted to be placed on the various desks or tables of an office, and actuated from a master clock, whereby the exact minute, hour, day of month and year can be stamped by simply pressing a lever or arm carrying the various dating wheels, in contact with the surface of the paper to be dated. These stamps work synchronously with the master clock and work so perfectly, and so simply that over five thousand impressions a day have been made for many days and weeks without the slightest indication of derangement of any of the parts. This is a simple means to secure accuracy in stamping bills, checks, letters and the various papers which require the exact minute, hour and date of receipt or to be delivered. It will soon become an invaluable adjunct to all well-regulated offices and factories, as useful and necessary as the telephone is in these strenuous business days, where time saved is so many dollars and cents added to the income of the successful business man. In addition to the use above mentioned, the company has just completed an attachment to this valuable little machine which will greatly broaden its usefulness to the manufacturer. The attachment is for the purpose of keeping a record of the time of each workman for the entire day, and consists of a flat plate, about eight inches square with a sliding stop, to be changed each day for one week, and then set back to the starting point.

The operation of the device is as follows: A blank card is given each employe, on which his name and address are written, and spaces for the time impression for an entire week, when he comes in the morning, goes out at noon, comes on again, and leaves at night. The workman selects his card out of the box which contains the cards, alphabetically arranged, slips the card into place against the above mentioned slide and by pressing down the lever as above mentioned secures an impression of the exact minute and hour of that day when he arrives and departed from his work. To secure the time of each employe at the close of the week is a simple matter of addition.

Having spoken of some of the valuable devices this company has perfected it is well to give a description of the synchronizing of clocks by using the telephone wires. The synchronizing of clocks by wire is not new, as the Western Union Telegraph Company and other companies have used their wires for this purpose, but the use of the telephone wires for this particular purpose has never successfully been accomplished until the system invented by Mr. H. W. Pidgeon, and now being manufactured by the American Clock Company, was introduced. The Western Union, necessarily, is compelled to run a wire to every house to synchronize its clocks, and at present comparatively few clocks are installed outside of where it has local telegraph stations; but the telephone, being a necessity, is in almost every home. The telephone company is accommodating enough to request their operators to give the subscribers the time of day, without charge, whenever a subscriber asks for the same, but this is not automatic and necessarily depends upon the operator giving the time as she looks at the clock used by that particular station. The American Clock Company has devised a method whereby it installs one of its electric clocks in the subscriber's home, and connects it to the telephone wires. At midnight, the telephone circuit is automatically cut out for from one to two minutes from the telephone lines, and the master clock which is located at the telephone station, has its circuit switched in automatically with all the clocks controlled from that station. The clocks are then synchronized at midnight, or at any hour of the night at which the telephone calls are the least frequent. The duration of time in which the telephones are cut out is so short that there can be no inconvenience to the subscriber, for frequntly it requires more than two minutes to get the operator at the central station. Herewith is shown a diagram illustrating the master clock, the telephone circuit and the secondary clocks and their circuits.



In the diagram *A* represents the master clock, which will preferably be located in the central telephone station, and *B* represents an outlying secondary clock. *C* and *D* designate, respectively, the outgoing and return lines of the telephone circuit. The meeting ends of the wires *C* and *E* and *D* and *F* are normally in contact, as shown, thus establishing a complete circuit through the telephone, indicated at *G*. *H* and *I* are the two lines of the primary master clock circuit, said lines having separated contact points *44* and *48* within the clock mechanism and including in the circuit a battery *J* and relay *K*. *L* and *M* are the two lines of the secondary master clock circuit, said lines have separated contact points *56* and *54* within the clock mechanism and including in the circuit a battery *N* and relay *O*. *P* and *Q* represent two lines connecting opposite ends of a relay *R* with opposite sides of a dynamo *S*, the line *Q* being normally broken at *q* and having an armature *q* co-operating with the relay *K* to close the circuit at *q*, but normally retracted by a spring *q*. Opposite the core of the relay *R* is a pivoted armature *r*, normally retracted by a spring *r* and carrying an insulated bridge *r*, holding the main telephone line wires *E* and *F* normally in contact with the central station wires *C* and *D*, respectively. *T* designates a source of electrical energy, such as a dynamo, which is connected on one side by a line *U* with the ground, indicated at *V*, and on the other side has a line wire *W* leading to a point opposite the core of the relay *O* and provided at such point with an armature *w*, normally retracted by a spring *w*. *X* designates a line leading from a point adjacent to the end of the line *W* by branches *X* and *X2*, having interposed fuses *Y* and *Y* to contact points *x* and *x*, opposite the terminal contacts of the main telephone lines *F* and *E*, respectively, and located on the opposite sides of said terminals from the contact points of the lines *C* and *D* from the switchboard station.

Referring to the connections of the secondary clocks with the main telephone circuit, *c* designates a line tapping either of the wires *E*, *F* of the main telephone circuit (the wire *E* as herein shown) and leading to a contact point *76* in the secondary clock. *d* represents another line leading from a co-operating contact point *79* in the secondary clock, through an electro-magnet *e*, to the ground, indicated at *f*. The electro-magnet *e* when energized actuates through its armature the mechanical devices which effect the setting of the minute hand of the secondary clock to the position simultaneously indicated by the minute-hand of the master clock.

Once in each twenty-four hours, preferably at a time when the telephone circuit line is practically idle—say, for instance, 3 a. m.—as the minute hand of the master clock approaches the hour the mechanism of the clock brings together the contacts which close the primary master clock circuit, represented by the lines *H* and *I*. This energizes the relay magnet *K*, which closes at *q* the heavier circuit energized by the dynamo *S*, thus energizing the relay magnet or magnets *R* and through the connections described disengaging the switchboard connections with the telephone line circuit *E F*. Thereafter, and when the minute hand of the secondary clock *B* nearly reaches the hour, as indicated by the secondary clock, the mechanism of said clock closes the contacts within the clock mechanism between the wires *C* and *D*, whereupon the complete clock circuit through the telephone circuit, represented *E F*, is established with the exception of the break opposite the relay *O*. Therefore, and at the instant the minute hand of the master clock points to the hour the mechanism of the master clock closes the secondary master clock circuit represented by the lines *L M*. This, through the relay magnet *O*, connects the wires *W* and *X*, thus establishing the complete clock circuit, and passing a current through the electric magnet *E* of the secondary clock, thereby actuating the synchronizing mechanism of the latter and setting the secondary clock to the exact time indicated by the master clock. This having been done, the mechanism of the secondary clock again breaks the circuit therethrough, at or about which time the mechanism of the master clock operates to break the primary master clock circuit, thereby the switch operating circuit *P Q* is auto-

matically broken, allowing the spring *R* to restore the continuity of the telephone circuit.

There is no question of the value of the system in any community and undoubtedly the time will come when every home will have its telephone and a synchronized clock.

This would be an excellent system for the various telephone companies to offer their subscribers as an inducement to install a telephone. In fact, it would work both ways, for the installation of a perfect time system would be an inducement to install a telephone.

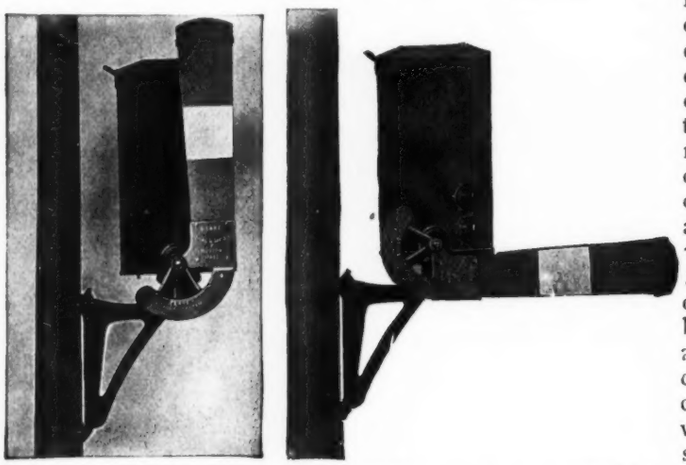
# DESCRIPTION OF BLAKE SIGNALS

*Abstract of a Paper Read Before the Central Electric Railway Association at Indianapolis*

By E. J. Burke

BLAKE signals are practically visual telephone signals, and their use removes the one-sided feature of railway line telephone systems as at present installed. These signals complete the calling system so that the telephones can be used to their full advantage by both dispatcher and car crews.

The rapid increase in the use of electric railways for inter-urban service and their invasion of the field of steam roads for inter-urban work, has accentuated the necessity for essentially the same methods of operation for electric as



**The Blake Signal, in Clear Position and with Arm in Horizontal Position.**

have proved best in steam road practice, including the use of regular train or car dispatchers. Simultaneously, there has arisen the question of communication between the dispatcher and the car crew, a question long ago solved by steam roads, by the use of telegraph lines with more or less frequent stations and operators. By this means in the event of any unforeseen derangement of traffic, or advisable change in schedule, the dispatcher can communicate with his various train crews and change their orders to meet the new conditions.

The relative necessity for thus communicating with crews can not be measured by the track mileage, for the reason that for a given number of miles of track, the electric road will operate at least three or four times as many train units as the steam roads under ordinary conditions, while on special days and holidays the electric road traffic will increase in a much greater proportion.

In winter, when the snow plows must be sent over the line, the need for this power of commuication is largely increased on electric roads. Realizing these facts, the management of many electric roads installed telephones at certain points, thus solving the problem so far as allowing the car crews to communicate with the dispatcher, but leaving unsolved the more important matter of permitting the dispatcher to selectively communicate with the car crew. To overcome this one-sided method of communication, orders were given that at certain points, all car crews should stop and call up the dispatcher. It is almost needless to call attention to the amount of time wasted by both crews and the dispatcher, as well as the halting and antiquated methods of operation that must necessarily result from all crews calling up from fixed points whether they are wanted or not, and the attendant discomfort and loss of time to patrons. The dispatcher is kept busy answering such calls, is thus distracted from more important duties, and is more liable to eventually make a mistake with the usual disastrous consequences. Time is money. Not only to the railway company, but to many of the passengers on its cars. If at certain meeting points a crew must lose a minute or two in calling up the dispatcher, it will not take many such stops to put said crew behind time. Also with this method, the running time must be lengthened, and on long runs, instead of getting four or five trips out of a crew and car, only three or four can be made in a day's work. The loss of a trip by any car crew means the loss of the money which that car and crew would have earned on that trip. Also, it means that in order to carry a certain number of passengers and earn a certain amount of money, eleven or twelve cars must be operated instead of nine or ten. This calls for not only a greater number of cars with the attendant increase of first cost and interest on investment, but the cost of additional crews, additional feed wire, additional power consumption, with increased cost of fuel, maintenance expense and supplies.

It is certainly the legitimate object of any railroad management to get the maximum earnings from a minimum of operation cost, consistent with the comfort and safety of its patrons; and any apparatus which will aid in this attempt, certainly has a positive value, both to the railroad company and the people whom it serves.

A dispatcher's signal eliminates all unnecessary loss of time, establishing a ready and certain means of communication between dispatcher and crew. In addition to the above, a reliable dispatcher's signal increases the safety of operation in the following ways:

All roads have certain meeting points where cars ordinarily pass, and the car crews become accustomed to stopping at these points and running by other sidings and turnouts. Now, if for any reason the dispatcher must give orders for crews to pass at unusual points, he can, by setting a semaphore and showing a red light, insure against the car crew forgetting to stop at this unusual meeting place. Furthermore, many accidents would undoubtedly be avoided by a dispatcher being able to set a signal and stop, or give caution orders to a car crew at any telephone point on the line.

The telephone has reached a state of perfection that makes it as safe and reliable as any human agency can be, while its use has become so general that everyone is accustomed to it and can use it with facility. Thus, the telephone becomes an ideal, cheap method of communication; no specially trained and schooled operator being needed to handle

it. The one thing needed in combination with the telephone is a signal; simple in mechanism, positive in action, and reliable in service, that can be operated by the dispatcher so as to call to a telephone at any desired point, and at that point only, any one of the crews on the line. This is a need that the Blake Signal was designed to meet, and that the solution has been eminently satisfactory is proved by the successful operation of this signal, in various parts of the country, during winters of exceptional severity, involving the severe tests of extreme cold and quantities of snow, ice, sleet, etc., as well as through summers of heavy traffic and the usual electrical disturbances.

The Blake signal is not an automatic signal in the usual acceptance of the term, and does not and never was intended, to cover the field of automatic signals. It is intended for use in connection with the telephone system, and the purpose of the signal is to allow the dispatcher to selectively signal to any point on the line, when he wishes to communicate with the passing crews. The Blake signal, in other words, gives the train dispatcher the same command of car crews that the steam road train dispatcher enjoys by using telegraph lines with stations at certain intervals, where the operators can be instructed to signal the train for special orders. The operation is simplified in that instead of communicating with a telegraph operator, giving orders and having the operator set a signal and repeat the orders to train crews, the dispatcher sets a signal and gives the orders to train crew direct by telephone on its arrival at a certain station.

The mechanism of the Blake signal is entirely independent of the telephone, and where telephones are already installed, the signal may be put up as an adjunct.

I have gone at some length into this discussion of the uses of the signal, in order that it may not be confounded in any way with automatic block signals.

The apparatus consists of dispatcher's office equipment and line semaphore signals, each signal containing an electro magnet and pendulum. These signal pendulums vary in length, and each one corresponds in length to one of the pendulums in the dispatcher's office. The dispatcher's office equipment consists of a desk-like box containing 15 pendulums of different lengths and platinum contacts, which are made and broken by the swing of the pendulums at intervals varying with the length of the pendulums, capable of transmitting impulses over the line (consisting of a single, bare, iron wire) which impulses are synchronous with that dispatcher's office pendulum which happens to be vibrating, and influence only that signal on the line which the dispatcher desires to operate.

The basic principle of the signals is that the time of vibration of a pendulum varies with its length. Therefore, if we, at some central point, such as a dispatcher's office, start in vibration a pendulum of a certain length, allowing it, as it vibrates, to open and close an electric circuit, electric impulses will be set up in that circuit, synchronous with the vibrating pendulum. These impulses energize the electro magnets of all the signals on the circuit, and start vibrations in all of the signal pendulums. On only one signal, however, namely that one whose pendulum is of the same length and therefore synchronous with the pendulum vibrating in the dispatcher's office, will these electro magnetic impulses be of a proper period to be cumulative in effect, and swing the pendulum in an ever increasing arc of vibration. On all the other signals, the impulses being out of beat, the pendulums will receive a check before they have swung through any considerable arc. On the signal which it is desired to set and on the pendulum of which these synchronous impulses are accumulating energy, the pendulum having reached a certain arc of vibration, mechanically trips a lock, releasing a three-foot semaphore arm which falls to the horizontal position by gravity. Having reached a horizontal position, this semaphore closes the local signal lamp circuit and also interruptedly closes a shunt to ground on the signal line, causing a sounder to draw up in the dispatcher's office and notify him of the fact that the signal has operated.

For instance, when the dispatcher wishes to set signal No. 9 he inserts a plug, similar to a telephone plug, in hole No. 9. This releases pendulum No. 9, and also connects the line with the 500 volt circuit which is brought to the dispatcher's desk. As the pendulum swings it opens and closes the signal line circuit, sending impulses over the line synchronous with its vibration. At the end of 13 seconds this line signal pendulum swings through an arc wide enough to trip a lock and drop the semaphore arm. The car arrives at the station and the motorman or conductor calls the dispatcher by telephone, saying "Brown and Hayes at No. 9 for orders." The dispatcher then transmits his orders to the conductor or motorman. The conductor or motorman, if so instructed by the dispatcher, then pulls a cord which sets the semaphore at "clear" position ready for future operation. Attention is called to the following points in this system:

*First,* when properly set up and adjusted, it is physically impossible for any other signal than the one desired to operate.

*Second,* that there is a positive indication to the dispatcher, showing that the semaphore arm has been set in the horizontal position, and that until the arm has reached an angle of about 45 degrees it is a physical impossibility for the dispatcher to get this indication and the danger of a false indication is eliminated.

*Third,* that the power for operating the signal is obtained entirely through the dispatcher's office, and there is no local circuit at each signal, other than the signal lamp circuit.

*Fourth.* There are no electrical contacts in series with the operating magnets at the various signals. The signal line is electrically continuous throughout, from the dispatcher's office to the return circuit at the end of the line.

*Fifth.* If one signal lamp burns out, a second lamp is automatically cut in circuit. This second lamp is in an interrupted circuit and gives a flashing light, so that any crew can report same and a new lamp can be put in the following day. This detail removes the necessity of having a daily inspection of all lamps, as well as danger from a new lamp being defective and burning out a very short while after it has been put in.

*Sixth.* The widely varying voltage of trolley lines is taken care of by relays which draw up at different voltages and cut in or cut out resistance as the voltage which is supplied at the dispatcher's office rises or falls. We are able to take care of voltage variations between 300 to 700 volts.

*Seventh.* The line consists of a single No. 10 bare galvanized wire supported on glass insulators.

This system is manufactured by the Blake Signal and Manufacturing Company, Boston, Mass.

## *MICHIGAN BELL DEBENTURES.*

If you happen to see the fact that the Michigan State (Bell) Telephone Company has sold $1,250,000 of 6 per cent three-year debenture bonds to N. W. Harris & Company of Boston do not be unduly excited, says King's Financial Bulletin. To be sure, the rate of 6 per cent is fairly decent and quite abnormal, but remember to take into your account the word "debenture." "Debenture" is a modest sounding word and yet it covers a multitude of sins. It means that although the bonds are called six per centers, there is no earthly guarantee that the 6 per cent will be paid, nor has the owner thereof any particular hold upon the promisers. The "debenture" business is one of the evil phases of American finance.

# MANUFACTURERS DEPARTMENT

## *WATCH AND SWITCHBOARDS.*

The Western Telephone Manufacturing Company of Chicago is carrying on an aggressive campaign for business. Some of the Western's literature is much more than ordinarily good. The following is a circular letter which is a product of the Western's advertising department. It is the kind of advertising that pulls and pays:

Style G "Western" Switchboard.

"When a man buys a handsome watch 'on its looks' he doesn't always get a good time keeper.

"Some men would rather have a handsome watch than a watch that keeps good time. Such men may look at their watches often, but they don't depend on them for time.

"Another man would buy a watch because it kept good time, and regardless of its looks. Such a man does not

Style G "Western" Lightning Arrestor Bank.

want to pay for appearances and doesn't care about anything else as long as his watch keeps good time.

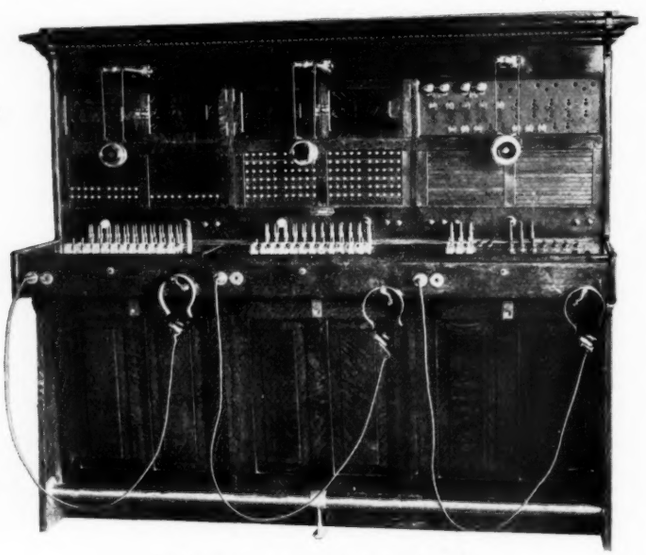
"Switchboards are like watches. There are switchboards that look good and won't work. There are switchboards that do work but which are an eye-sore to their owners.

"It costs more money to get a good watch movement in a solid gold case than it does to get a poor movement in a cheap case.

"There is where switchboards differ from watches. The maker of the poorest board and the very ugliest design

Style K "Western" Switchboard (Desk Type).

asks and expects just as much for his equipment as the manufacturer who makes only the best grade of switchboards, and has learned that it pays to make his switchboard



"Western" Central Energy Special.

of an attractive design as well as a perfect piece of telephone apparatus.

"There are many makes of switchboards and many types of each make.

"There aren't any switchboards made better than the Western, and with due modesty we must say that we have never seen any that we thought were quite so good.

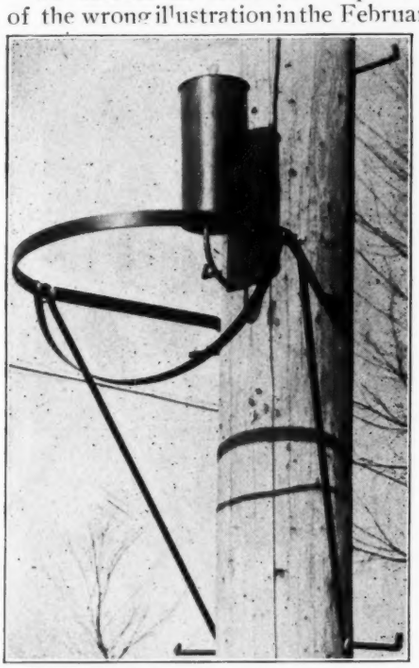
"When you buy a Western switchboard you are safe with it. It is reliable. It is well designed and well made. You have the same sort of satisfaction that a man does when he takes a good watch out of his pocket on a railroad train and finds he is on time.

"An Ingersoll dollar watch may be a triumph of mechanical ability in cheapness of cost, but it isn't the kind of watch you depend on if you have an important engagement, and it isn't the kind of watch you pull out of your pocket in a conspicuous manner in company.

"Now with the Western switchboard you may be proud of its design and proud of the way it works. It will stand abuse, but don't abuse it because it deserves better treatment. A poor operator can do good work with it, but give yourself a square deal and get the best operator you can find. A Western switchboard is something more than a combination of lifeless parts merely. It is a partner in your business,—only you get all the profits.

## *A SAFETY SEAT FOR TELEPHONE BUILDERS.*

To correct an erroneous impression, caused by the use of the wrong illustration in the February TELEPHONY, we present herewith a correct representation of the Coar safety seat, made by the Telephone Appliance Company of Minneapolis, Minn. It is claimed for this device that it is: A combination seat, safe as a cradle. Is rigid and permanently constructed of mild steel, and lowest initial cost with no maintenance.



The Coar Safety Seat, Improved Type, Showing Seat Ready for Use.

It is applied to a pole with four bolts, two of which serve as foot rests, and can be used as a seat or as a substitute for a lineman's safety belt.

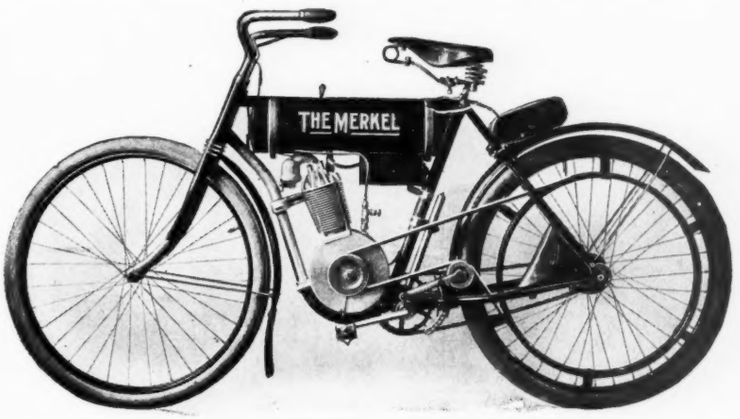
The seat is sightly, folding up like a jack knife. Workmen climb through instead of over it, lessening time and danger. It is roomy and comfortable; no caught or loosened belt tools, and is free from accumulation of snow or sleet.

## *MERKEL SPRING-FRAME MOTOR CYCLE.*

While the American people have been slow in recognizing the general usefulness of the motor cycle, both as a pleasure and commercial vehicle, a large number of them can be seen in the leading centers of this country. In Milwaukee is located, not only one of the oldest but also the second largest motor cycle manufacturing plants in the United States. The Merkel Motor Company's factory is located in the southern outskirts of the city, known as Layton Park subdivision, and it is an outgrowth of the original Layton Park Manufacturing Company which, during the height of the bicycle craze, manufactured bicycle hubs and other accessories for the trade.

In the latter part of 1900 Mr. J. F. Merkel become associated with the old Layton Park Manufacturing Company, and after having spent more than a year in experimental and developing work, started to remodel the old plant, install new machinery and produce a complete motor cycle. Since that time and during the succeeding years his company has produced a great number of motor cycles, and by judicious advertising and conscientious work gained the confidence not only of the commercial trade of the United States, but placed a large number of machines in the old world. During the past year the Merkel Motor Company has trebled its output, confining practically its entire working force to the production of motor cycles.

The accompanying illustration shows the company's 2¼ horse power spring frame motor cycle. The distinctive features of the motor cycle may be mentioned as the spring




Merkel 2¼ Horse Power Motor Cycle.

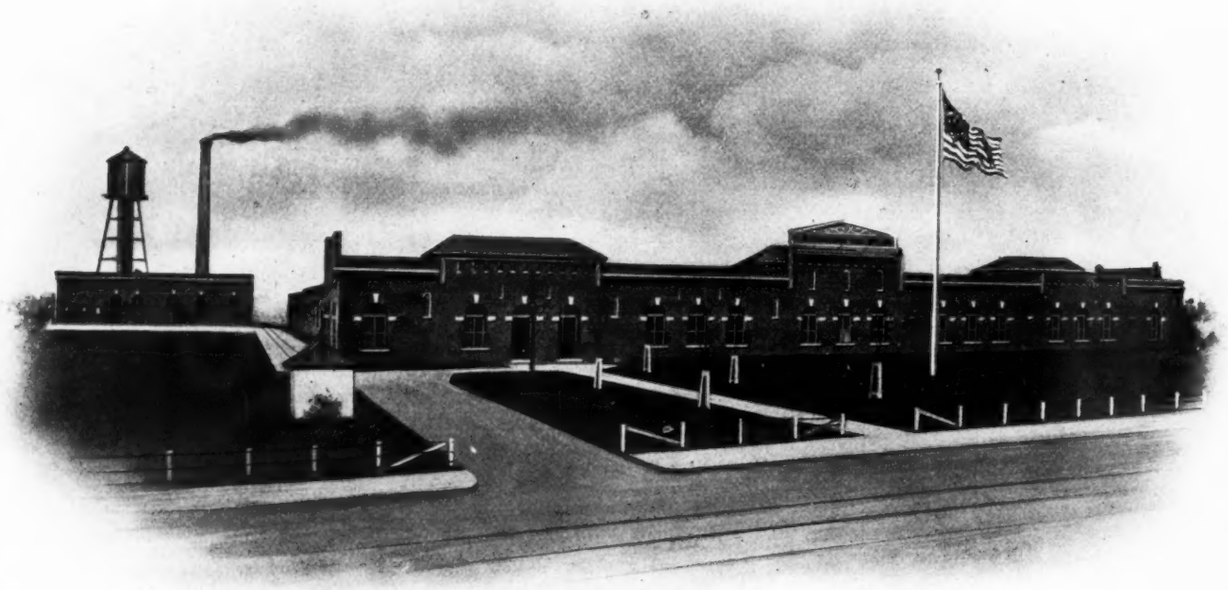
frame, long wheel base, large easy riding tires, positive grip control, etc. A peculiar feature of the Merkel line of motor cycles is its new spring fork attachment. A Merkel motor cycle equipped with spring frame, spring fork and hammock motor seat saddle, makes a most easy riding machine. The loop tube in the frame construction which carries the motor or engine, permits of the carrying of the motor lower, thereby bringing the center of gravity closer to the ground, and making the machine easier to balance and more comfortable to ride.

In the past the greatest volume of business has been in behalf of pleasure and recreation, but during the present year the commercial side of the motor cycle industry has been greatly enhanced. Motor cycles are being adopted with a great deal of success as a commercial proposition. Leading merchants in large cities have purchased them for quick package delivery in both city and outlying districts, sometimes using the machine with its three-wheel side car attachment. Gas companies, during the past two years, have adopted them for the use of their street foremen, stove repair departments and meter inspection work.

Telephone companies have found them extremely useful and economical in reaching outlying stations and lines. To even the casual observer this field of usefulness will at once be appreciated. The motor cycle enables telephone repairmen and linemen to reach in a very short time the most remote subscriber. With the addition of the carrying receptacle, which can be placed on the front fork, necessary tools and supplies can easily be taken care of. Either one of the two leaders of the Merkel motor cycle line, the 2¼ horse power machine shown herewith, or the newer model with spring fork attachment, vertical engine, new position of batteries, and other minor improvements, is desirable for telephone companies' use. Any further information along the line of motor cycles adaptable for the use of telephone companies can be secured by writing the Merkel Motor Company, 1118 Twenty-sixth avenue, Milwaukee, Wis.

## *THE NEW L. M. ERICSSON TLEPHONE FACTORY.*

For a number of years the L. M. Ericsson Telephone Manufacturing Company has been one of the leading factors in the telephone industry of the world. The parent factory, located in Stockholm, Sweden, and having branches is various European cities, has for some time past maintained a branch in New York City which operated quite extensively throughout the United States and contiguous territory. When the telephone business of this continent became sufficiently established and had attained such magnitude as to warrant erecting a separate establishment on this side of the water, a careful investigation of available sites was made during the past couple of years, and Buffalo was finally selected as best suited for this purpose. Besides being the eastern terminus of the Great Lakes and the western terminus of the Erie canal, Buffalo has superior railway facilities, having sixteen trunk lines. This advantage not only affords the best possible shipping facilities, but enables manufacturers to secure materials promptly and reasonably as well as to employ skilled labor at a reasonable price. Another advantage is afforded by the unlimited power of Niagara Falls, which is supplied to this new Ericsson plant through a private underground conduit from the power company's 2,200 volt mains by means of a cable with capacity of 600 horsepower. The current is received at 2,200 volts and transformed for power to 440 volts and 220 volts for lighting purposes. All wires are carried underground.



Factory of the L. M. Ericsson Telephone Manufacturing Company, Buffalo, New York.

The site of the new Ericsson factory occupies thirteen acres lying between the New York Central and Eastern River railroad tracks and the Military Road, along which runs the electric line between Buffalo and Niagara Falls. Operations are now being extensively conducted there in a very complete plant of many model features. As it stands at present the new plant has two main buildings of the most modern design and construction, built of shale brick and Portland cement mortar, no lime being used at all. It is but one story in height and without stairs or elevators. The roof construction is of independent trusses, well braced, so as to eliminate all vibration and give rigid support for the shafting. The floor is made of expanded metal and concrete covered with maple. In this building the posts are placed on 25-foot centers one way and 10½-foot centers the other way.

A long hall, containing the lavatories, has walls of enamel brick, steel roof construction with skylights, and mosaic floor. Separate steel lockers and solid porcelain wash bowls are provided for the employes and settees are arranged between the windows for accommodation during the noon hour. Nothing has been overlooked that would contribute to the comfort of the employes.

Further evidence of the care taken for providing every possible comfort and convenience is evidenced by the fact that the plant is heated and ventilated by Sturtevant's hot air system. Large ducts are laid under the floors and along the walls. A 14 foot 7 inch fan, driven by a 50-horsepower motor, forces the heated air into the building through registers in the east and west walls. It is driven 125 feet each way toward the center, where the used air is drawn out through registers in the floor.

At the side of the boiler room is the fan apparatus with a heater containing 14,000 linear feet of steam pipe. Space is allowed for an additional 14 foot 7 inch fan and its heater.

Back of the boiler room is a large forge and grinding shop. Here are also placed the furnaces and ovens for annealing and hardening.

Economy in operation is also furthered by means of private switches from the New York Central & Hudson River railroad tracks which run along the south side of the building for unloading the raw material into the receiving room and loading the finished product from the shipping department.

Figure 1 shows the press room with a row of machines commencing with a two hundred and ten ton press, which has a separate motor, down to the smallest machine for stamping various small parts.

Brown and Sharpe and Acme four-spindle automatic machines, which turn out four parts for each revolution of the turret, occupy the adjoining bay, Figures 2 and 3. Ample room is provided for additional machines.

The tool room, shown in Figure 4, is one of the best

equipped tool and die rooms in any telephone factory. The milling machines and grinders are all of the Brown and Sharpe make. For the valuable tools, dies and gigs a large fireproof vault is provided.

Each bay in the main factory room has its main shaft run by an individual motor.

The electroplating and enameling departments, buffing room and winding departments, Fig. 5, are all equipped with the most up to date apparatus. The power house contains two 200-horsepower boilers for heating and one 20-horsepower boiler to supply steam for use in the factory during the summer months.

Figure No. 6 shows the lavatories, lockers, etc., for employes.

The transformer room has two 200-kilowatt Westinghouse transformers with space provided for another 200-kilowatt Westinghouse transformer, making a total of 600 horsepower. In here are the smaller transformers for light, the main high tension primary panel with oil switches, time relays, recording ammeters, etc. There are also secondary distributing panels with main switches for the different groups of motors. The gas plant consists of a large air compressor and oil pump. This plant supplies all the heat for the furnaces, ovens, brazing burners and the 20-horsepower boiler. Fuel is supplied from a 10,200 gallon oil tank located under ground and outside of the building. This arrangement is entirely automatic and can produce any quantity of gas required. The whole plant is supplied with sprinklers, and a secondary supply from a 50,000 gallon tank.

Care was taken in designing this handsome new factory to provide plenty of room for growth, as it is expected that three more factories will be added to the present buildings in the near future. In fact, plans for same have already been drawn. These additions will necessitate no change in the installations and equipments of the present buildings

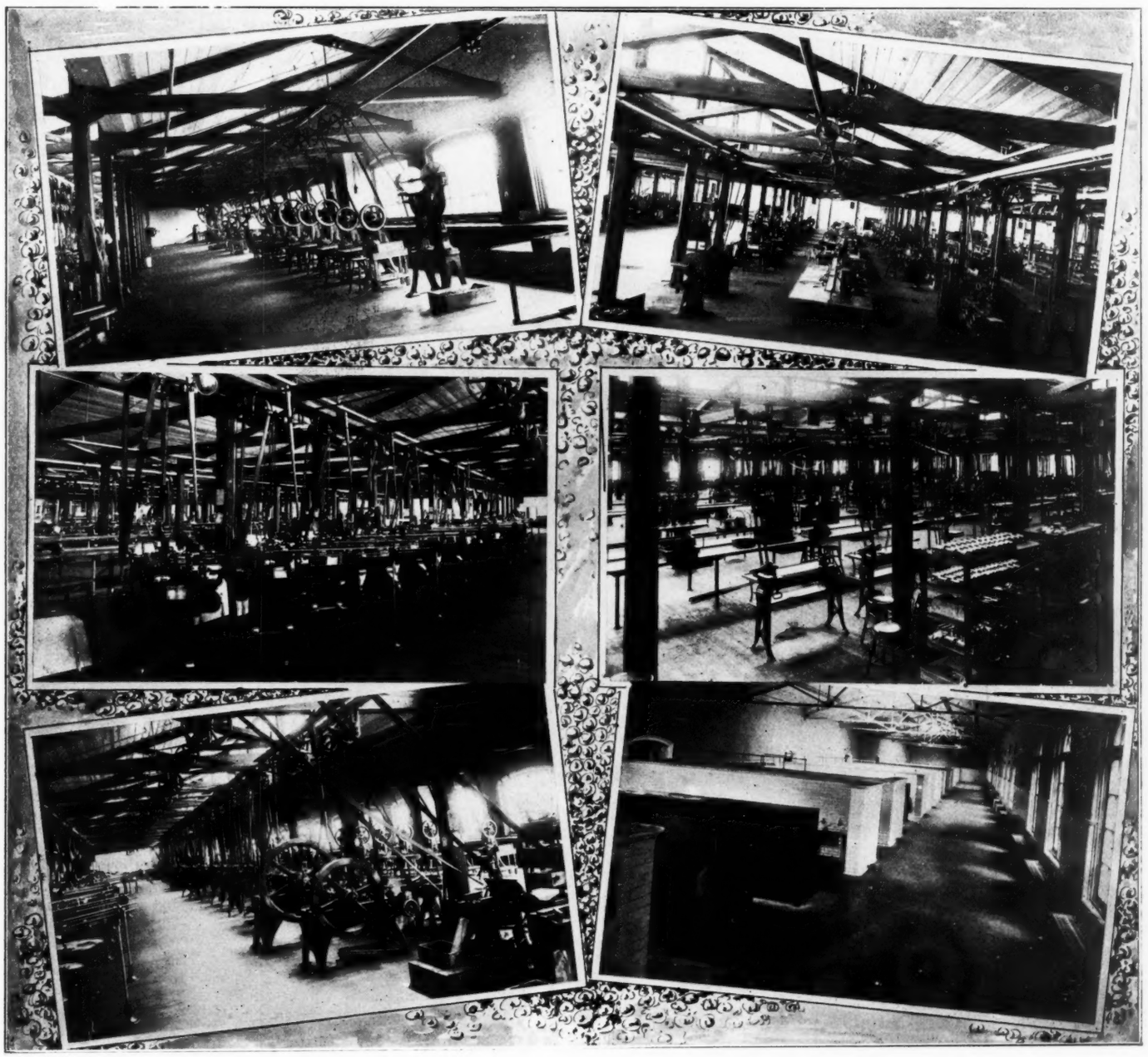


Figure 1—Press Room.
Figure 2—Automatic Machine Room.
Figure 3—Automatic Machine Room.
Figure 4—Toll Room.
Figure 5—Electroplating and Enameling Department.
Figure 6—Lavatories, Lockers, Etc.

Views in the L. M. Ericsson Telephone Manufacturing Company, Buffalo, N. Y.

as regards water, power, heat, light and other necessities. A broad lawn, which is cared for by an experienced landscape gardener, greets visitors to the new establishment, and heightens the generally pleasing and satisfactory effect which is one of the main ideas pervading everything which the L. M. Ericsson Telephone Manufacturing Company makes or plans.

### *SHAWMUT ALL-COPPER GROUND CONNECTORS.*

The Chase-Shawmut Company has just issued a "flyer," descriptive of the Shawmut all-copper ground connection clamp, which it manufactures. For telephone work, it is said, the Shawmut all-copper ground connecnection clamp will be found very satisfactory. Instead of being obliged to bother with soldering the wire to a pipe, the current may be grounded in a neat manner and give perfect electrical contact. Care should be taken that the pipe is carefuliy cleaned before the clamp is put in place.

This clamp is made in two parts and when installed it is locked in such a manner as to give the maximum contact on the device upon which it is installed. It is simple in construction, and requires only a pair of pliers to install it quickly and properly. It is also used to a large extent for grounding the metal sheaths on cable, and for grounding conduit installations. For this latter purpose it is pronounced the simplest and cheapest device on the market.

It is made in sizes from one-half to three inches, and is designed to take a No. 4 wire.

### *BARGAINS IN TELEPHONE EQUIPMENT.*

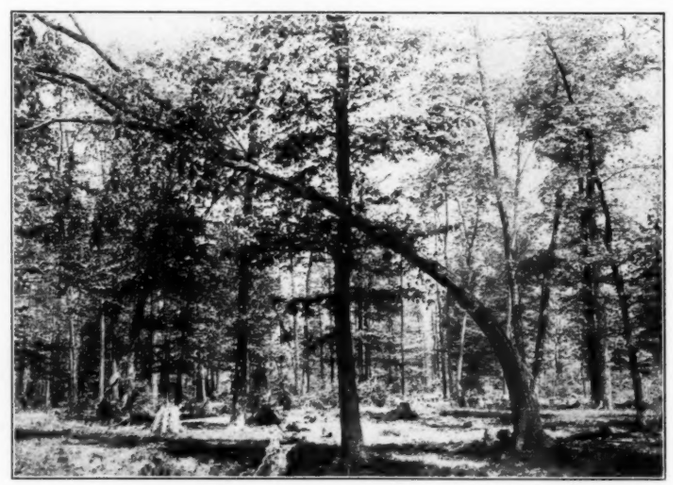
The Telephone Equipment Company, of 322 Sixth street, Racine, Wis., announces in this issue of TELEPHONY that it has for sale a choice lot of guaranteed telephone apparatus which can be had at rare bargains. All of this equipment, including central energy, bridging, series and party line types, has been thoroughly tested and is guaranteed to be in first class working order. Interested parties are invited to write for descriptive circulars and price lists.

### *WAPAK ANCHOR TEST.*

An interesting test of the holding power of the Wapak anchor was recently made at Wapakoneta, Ohio, the headquarters of the manufacturers, the Wapak Hollow Ware Company. The accompanying illustrations tell the story almost without words, and show the great strength of the anchor, which is described as a device for quickly and cheaply guying telephone poles, trolley poles, derricks, etc. In order to have something strong and tough to pull against, a white elm tree was chosen, which measured five feet eight inches in circumference about three feet and a half above ground, and was approximatly 100 feet high. By means of an Iwan auger a seven inch hole, five feet deep, was bored into the ground, which proved to be average clay soil. A No. 3 Wapak anchor, with blades folded against the rod, was dropped into the hole and the hole filled. All this was done by one man in less than ten minutes. The anchor and the tree were pulled against each other by means of a system of pulleys and ropes, three strands of one-inch rope pulling on the anchor and the tree, the fourth wound on a windlass turned by four men. When the stress was applied, the blades of the anchor spread out laterally, entering the solid, undisturbed ground on opposite sides of the hole. As the men continued to turn the cranks of the windlass the tree was bent little by little, the anchor remaining unmoved.

Wapak Anchor vs. a Twenty-Two Inch White Elm Tree Pulled Against Each Other by a Windlass Turned by Four Men.

Pulling Hard Against the Anchor. One Inch Rope Pulls in two. Four Strands of One and One-quarter Inch Rope Substituted.



The Anchor Holds its Own; The Tree Begins to Crack Too Much for the Four Strand. Steel Cable and Steel Blocks Substituted.

Suddenly the windlass was torn to pieces and the tree, springing to its former upright position, hurled the large iron wheel of the windlass through the air as if it were a pebble. A stronger windlass was then obtained. The process was continued until the one-inch rope broke. A new one and a quarter inch rope and steel pulleys were then substituted, four strands of the rope pulling on the anchor. The tree was bent over farther and farther until finally this rope also broke, the anchor, remaining fixed, proved stronger

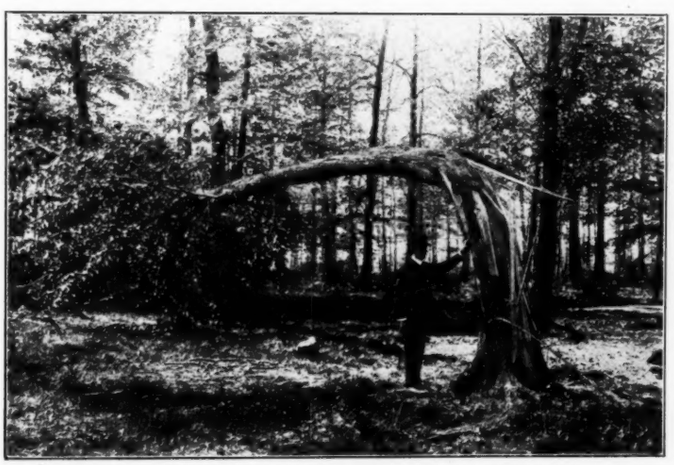
than the four strands of inch and a quarter rope. The tree then assumed its upright position.

Having no heavier equipment at hand operations were suspended for the day and continued a week later when three strands of steel cable were used in place of the four strands of inch and a quarter rope, which had broken. The fourth strand of the steel cable was attached to a second

A Prostrate Victim to a Wapak Anchor. The Anchor Never Budged.

system of ropes and pulleys, and this terminated at the windlass.

Little by little the majestic elm bowed to its fate until amid sounds similar to the reports of a gun, it was literally torn to pieces, splinter by splinter. This splintering took place from a point about twelve feet above ground and extended clear down into the roots. The tree is now lying on



Rear View Showing How Tree Was Torn Fibre From Fibre.

the ground, but the Wapak anchor remains firmly fixed just where it was set. The Wapak anchor was invented by S. P. Hicks, Wapakoneta, Ohio.

## *THE ROLFE FUSE BOX.*

The Rolfe Electric Company of Rochester, N. Y., reports that the sales of its approved fuse box have increased to such an extent as to tax its factory to its utmost. Companies using this box are said to be more than pleased with the results, and not a single case of damage has ever been reported where they are installed. Throughout the east, where power lines are crossing and recrossing on almost every street and road, it is necessary that a protector be used that is absolutely trustworthy, and for that reason, it is said, the Rolfe fuse box has been adopted by nearly all the large telephone companies.

Underwriters' requirements are very strict, and the Rolfe company was the first to make a protector which met these specifications. From the first the company has devoted its efforts to making the best individual station protector that could be manufactured.

A complete description, prices, etc., will be cheerfully sent upon request to the home office of the Rolfe Electrical Company, Rochester, N. Y.

## *THESE BELIEVE IN PROTECTION.*

Frank B. Cook has received a great many orders for his No. 10 re-soldering protectors for switchboards since he furnished the 16,000 pairs for the St. Louis main office. A few of the recent orders are as follows:

National Telephone Company, of West Virginia, Wheeling, W. Va.; Home Telephone Company, Ironton, Ohio; Martin Telephone Company, Webster City, Iowa; Auburn Telephone Company, Auburn, Ill.; Monticello Telephone Company, Monticello, Ind.; Tri-State Telephone and Telegraph Company, Minneapolis, Minn.; Chicago Telephone Supply Company, Elkhart, Ind.; Southeast Missouri Telephone Company, Charleston, Mo.; Electric Appliance Company, Chicago, Ill.; Bureau County Independent Telephone Company, Princeton, Ill.; York County Telephone Company, York, Neb.; Suburban Telephone Company, Maplewood, Mo.; York County Telephone Company, Waco, Neb.; Bradshaw Telephone Company, Bradshaw, Neb.; Kellogg Switchboard & Supply Company, Chicago, Ill.; North Electric Company, Cleveland, Ohio; Century Telephone Construction Company, for the Ingersoll Telephone Company, Ingersoll, Ont.; Minier Mutual Telephone Company, Minier, Ill.; Local Telephone Company, Greenwich, Ohio; Stromberg-Carlson Telephone Manufacturing Company, for the Anaconda Copper Mining Company, Butte and Anaconda, Mont.; Wettstein Construction Company, for the Johnson County Home Telephone Company, Sterling, Neb.; Fredonia Co-operative Telephone Company, Fredonia, Kansas.

## *THE AMERICAN ELECTRIC FUSE COMPANY'S NEW SWITCHBOARD PROTECTOR, TYPE "H."*

On advertising pages 32 and 33 the American Electric Fuse Company of Muskegon, Mich., and New York, illustrates and describes the new American Type "H" switchboard protector, together with main, intermediate and wall distributing frames.

The American Type "H" switchboard protector is a finely made and excellent piece of telephone apparatus. It has proved very popular with the trade and the company has booked a large number of orders for this type of protector. We suggest that every reader will find it a matter of interest and advantage to read the company's advertisements in this issue. The company announces that it will be glad to send free samples on request to those interested and that it is now in shape to fill orders for this type of protector.

## *A USEFUL TELEPHONE SPECIALTY.*

Operating companies giving party line service over the country are rapidly coming to realize the immense value of telephone condensers as trouble savers. A great many devices of various kinds have been placed on the market with the avowed intention of relieving the party line from the evil effects of that inborn curiosity, which impels many party-line subscribers to take down their receivers and listen when messages to others are going over the line. From the operator's standpoint, there is no real harm in listening in. The trouble comes from the fact that, with receivers off the hook, others on the line cannot be called and very often the curious subscriber breaks in before the signal is completed with the result that the called subscriber does not really know that he is called. Condensers relieve this situation entirely, but the installation of an ordinary tin

case condenser requires some little skill with the pliers and soldering iron. This fact has prevented a great many rural companies from attempting to install condensers on their party lines.

A new instrument has been devised by the Julius Andrae & Sons Company, of Milwaukee, which is the regular one-half M. F. condenser, covered with a small cast iron case, and fitted with cord and binding posts. It is a very simple matter to connect this cord in the place of the receiver cord, and in turn connect the receiver cord to the binding posts on the condenser. No inside work is necessary, no breaking of connections or re-soldering of joints. It is needless to say that this device has proved very attractive to party line operators, and is selling in immense quantities all over the country.

## *KAYE & CARTER'S CEDAR YARDS.*

TELEPHONY presents in this issue four views of various yards conducted by the Kaye & Carter Lumber Company,

One of Kaye & Carter Lumber Company's Cedar Yards.

of Minneapolis, Minn. This concern deals almost entirely in the production and sale of cedar products from its own

Method of Decking Poles.

lands, buying stumpage from the state and also stock from the settlers, as well as contracting with parties owning ce-

Method of Loading Poles.

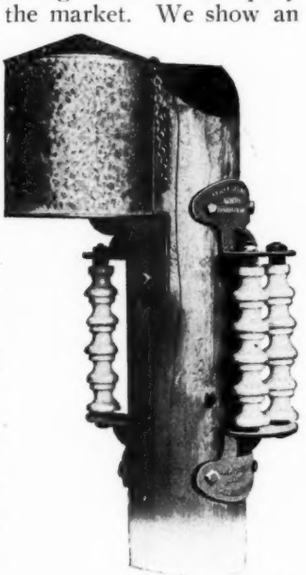
dar, wherever it it satisfactory and available. Mr. C. S Carter, a member of the firm, lives at Hines, Minn., and gives his personal supervision to the producing and shipping end of the business, while Mr. C. A. Kaye conducts the office in Minneapolis, looking after the sales and collection end of

Loading Poles on Car.

the business. This firm also has large stocks in Michigan and Wisconsin, and conducts an extensive jobbing business. The stocks, being maintained at various points, afford Kaye & Carter advantages in freight covering all the territory from Pennsylvania to Colorado and from Canada to the Gulf. They are soliciting trade in all of this territory, and inform TELEPHONY that they are in a position to supply everything desirable in their line. The headquarters of this concern is in the Lumber Exchange, Minneapolis, to which place inquiries regarding poles should be addressed.

## *ROBINSON DISTRIBUTION RACKS.*

Many improvements have been made in the Robinson distribution rack since the W. G. Nagel Electric Company of Toledo, Ohio, first put it on the market. We show an illustration on this page of the Robinson rack as used in connection with can top. Modern construction is fast doing away with the multiplicity of overhead wires, having distribution altogether from aerial leads, especially in congested districts where a large number of telephone installations are made.



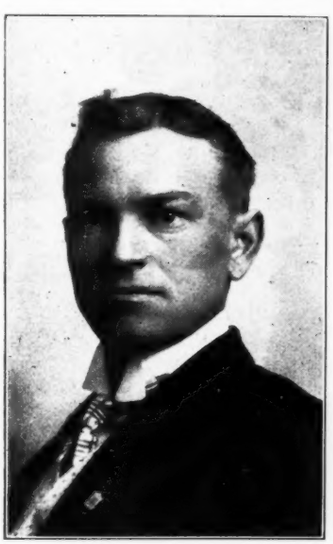
The extreme flexibility of the Robinson pole rack makes it one of the most desirable methods for distribution. Some of the large companies are distributing from every other pole, having no open wires or leads. The advantages claimed for the Robinson rack over other old-style circle top are many, among them being the item of expense, which is said to be about fifty per cent less than the circle top; no waste of insulation; the placing of distribution on side of pole to which drops are made, as it is possible to distribute five pairs from one side of the pole, and ten pairs from the opposite side. It is also very easy to trace circuits in looking for trouble, and the insulators used on the Robinson rack have a special drip feature which prevents leakage between pairs. All parts are malleable iron, and all metal parts are galvanized.

The W. G. Nagel Electric Company will be more than pleased to send full descriptive matter of this rack to interested parties.

*ACME TELEPHONE & MANUFACTURING CO.*

The Acme Telephone & Manufacturing Company, of Albia, Iowa, has been forging to the front very rapidly since the factory was moved from Chicago last October. Mr. G. M. Heiserman, the company's president and general manager, with some Albia associates purchased the Acme company last August and immediately made plans to move the plant to Iowa. A new and first-class factory building was erected at Albia and the latest and most modern machinery was installed throughout. This installation, with the machinery and tools of the Acme company had on hand, placed it in a position to manufacture almost every part of the apparatus turned out under the Acme name plate.

Factory of the Acme Telephone and Manufacturing Company, Albia, Iowa.



Grant M. Heiserman.

W. O. (Billy) Meissner.

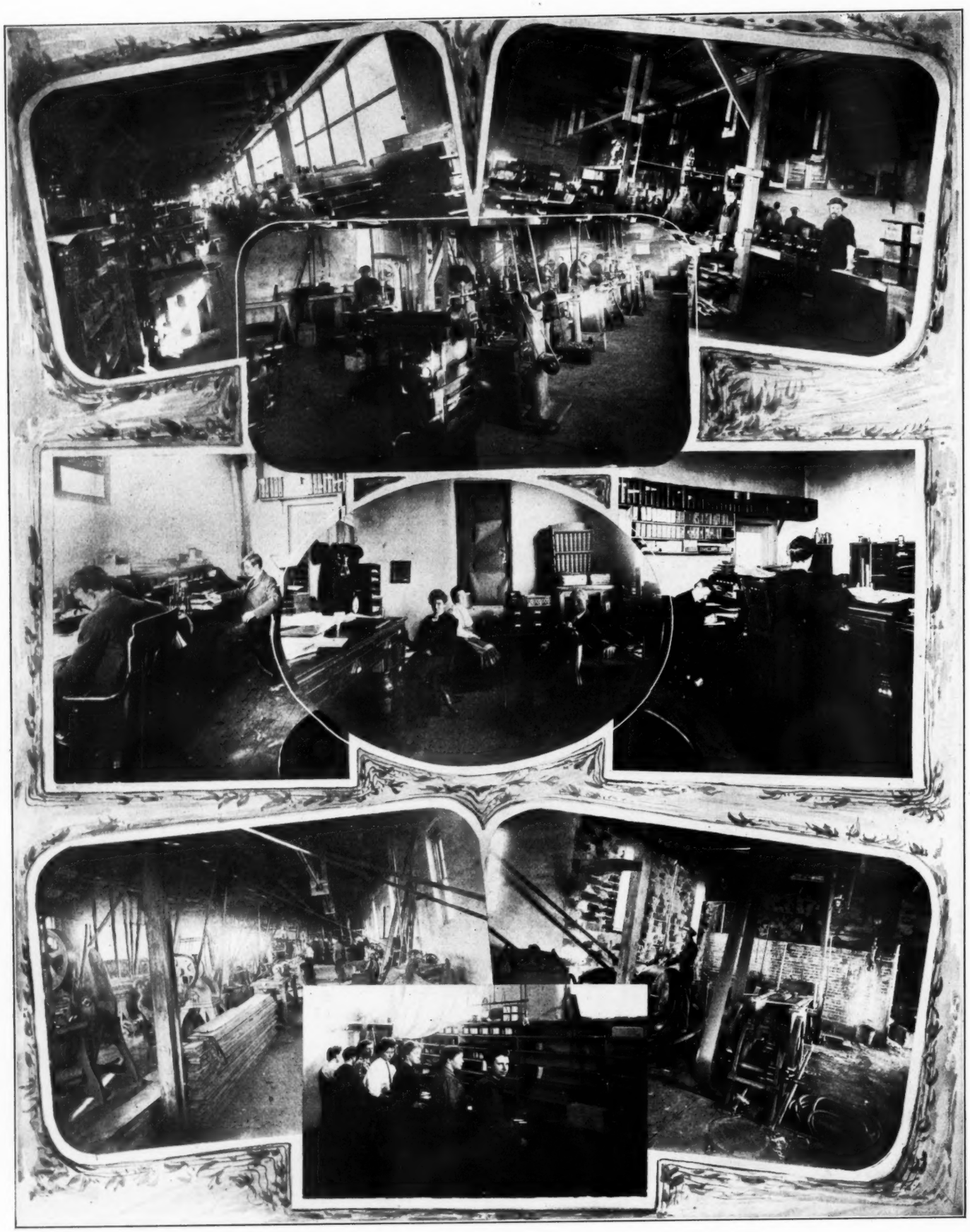
The location of the factory at Albia was particularly fortunate for the reason that the surrounding country for a distance of five hundred miles is well developed telephonically, there being in Iowa alone nearly three thousand Independent telephone systems, many of which are farmer and rural lines, for which the Acme company manufactures a complete line of apparatus. The town has splendid railroad facilities. It is located on the direct east and west trunk line of the Chicago, Burlington and Quincy Railroad. The Minneapolis and St. Paul Railroad gives a direct north and south outlet and the comprehensive Wabash system touches the town with a direct line.

The illustration of the Acme factory on this page and the interior views on the opposite page will give the reader an idea of the company's plant. The apparatus turned out is given a severe test over the Albia Telephone Company's long distance lines before being shipped, thus insuring its practical working. The Albia Telephone Company's entire system, covering, with its own lines, all of Monroe county, is equipped throughout with Acme apparatus, which is giving first-class service.

The company has just completed and has ready for the trade some new equipment of modern design, embodying many original ideas. Its booklets and folders illustrating and describing the complete line of Acme telephone apparatus will be sent free to those interested. The company calls especial attention to its "Blue Book" of telephone information which will be sent without charge as long as the supply lasts. This book is well printed and illustrated and gives much valuable information as to construction, installation troubles, etc. Those who have not received this book should write for it before the supply is exhausted.

The officers of the company and the men who are working to make the phrase, "Acme Telephones Excel," are most of them well known in the telephone field.

Grant M. Heiserman, president and general manager,



Views in the Acme Telephone and Manufacturing Company Factory, Albia, Iowa.

has had ten years' experience in the Independent telephone field. Six years of which time have been spent in the operating field and four years in the manufacturing and assembling of telephone apparatus. Mr. Heiserman is one of the principal owners of the Albia Telephone Company, has many other interests and is widely known in Iowa and the west.

W. O. Meissner, whom everybody knows as "Billy," is vice-president and chief engineer, and has had a wide experience in the telephone manufacturing field, being one of

E. J. Renz.

T. R. Cole.

the pioneers and the first man to build telephone switchboards (for Independent use) in the west. These switchboards were built by the Washington Electric Company in 1894, of which company Mr. Meissner was founder and principal owner. This company was absorbed by one of the large telephone manufacturing companies, Mr. Meissner taking the position of general superintendent, which position he held until he organized the Acme company in 1901. Mr. Meissner is a mechanical and electrical engineer and is an inventor of some note.

J. C. Mabry, secretary, and J. S. Moon, treasurer of the company, are Albia men who have had considerable experience in manufacturing and commercial enterprize.

T. R. Cole, the company's sales manager, is a young man from whom much may be expected. He is an aggressive, untiring worker and promises to keep the Acme name prominently before the telephone buyers everywhere.

E. J. Renz, manager of the drafting department, and Richard Meissner, manager of the assembling department, are men of long experience in their particular lines.

Taking it all around, the company is well officered, is well located, has a complete line of telephone apparatus and should continue its growth until it becomes one of the large telephone manufacturing concerns catering to the Independent field.

## *TELEPHONE EQUIPMENT FOR SALE CHEAP.*

W. C. Sterling & Son Company, large cedar pole dealers, are interested in the stock of material that was formerly owned by the Equipment Company, manufacturers of telephone switchboards. They are going out of business and the stock is left with W. C. Sterling & Son Company, of Monroe, Mich., and Mr. Hugh O'Connor, of the Michigan Wire and Cloth Company, of Detroit. These parties are anxious to dispose of the stock, and will do so at a great sacrifice. The stock is advertised in this issue of TELEPHONY. It includes magnetos, cotton-covered wire and, in fact, all kinds of wire, carbons, ringers, switchboard frames, brackets, resistance coils, etc. This is advertised as an excellent opportunity for a party wishing to build a small exchange, as the whole is offered very cheap. Interested parties should take the matter up with Hugh O'Connor, of the Michigan Wire & Cloth Company, or with W. C. Sterling & Son Company, of Monroe, Mich.

## *WESTERN ECONOMIST TELEPHONES.*

It would seem as if it was almost impossible to design a radically different and decidedly new type of telephone, but the Western Telephone Manufacturing Company of Chicago seems to have been able to accomplish this difficult thing. The Western Economist telephone is certainly unique, and the large sale which it is meeting with in the trade indicates that the manufacturer's claims for it constitute a strong argument to the telephone buyer.

Western Economist Telephone.

The Western Economist has only one shelf. The generator is mounted on the bottom or floor of the cabinet, the induction coil being mounted above it. The switch hook is mounted on the front of the one shelf in the cabinet, and the dry batteries are set behind the switch hook where they are easily "getatable." This arrangement makes the cabinet very compact, but it also possesses the very desirable feature of bringing all the wiring "down in front."

The Western Telephone Manufacturing Company advertises that any man with a ten cent screw driver, a pair of hands, and one good eye can make any repairs ever needed on a Western Economist telephone. The instrument certainly has the appearance of simplicity and strength, and the Western company's aggressive advertising campaign is bearing fruit in largely increasing orders for what appears to be a thoroughly high class telephone.

## *T. M. PARTRIDGE LUMBER COMPANY.*

During the past few years, TELEPHONY has seen several very successful enterprises developed by young men of energy and experience who cater to the telephone trade. Among this number we very cheerfully include the T. M. Partridge Lumber Company, of Minneapolis, Minn., which during the past year has increased its capital stock from

T. M. Partridge.

H. F. Partridge.

$50,000 to $100,000 in order to accommodate its growing trade and provide adequate facilities for future growth. The T. M. Partridge Lumber Company is a Minnesota corporation, organized in January, 1901. T. M. Partridge is president; H. F. Partridge secretary and treasurer, and F. B. Partridge vice president. The first two named are particularly well known among telephone and cedar men. Portraits of the officers are presented herewith, together

with views of some of the firm's yards. They have yards in Mizpah, Lammer's Spur, Houpt, Funkley, Tafts, Blackduck and Tenstrike. The Tenstrike yard in particular is a very large one, employed for concentrating stock from various smaller yards. The firm has a saw mill at Tenstrike and manufactures pine lumber and white cedar shingles. It also has a large general store at Houpt, Minn. The T. M. Partridge Lumber Company is one of the largest con-

Short Pole Stock at Tenstrike Cedar Yards of T. M. Partridge & Co.

cerns of its kind in the northwest, owning its own land and producing all of its own stock. It has recently opened a new yard in Beaudette, Minn., on the boundary line between Canada and Minnesota on the Canadian Northern Railway. The Canadian trade is supplied from this yard. Being amply equipped as to capital and experience and

Loading Stock at Tenstrike Cedar Yards of T. M. Partridge & Co.

having every facility for securing a satisfactory stock of poles, the Partridge company can be depended upon to supply its customers with the best possible grade of goods and unusually satisfactory deliveries at very reasonable prices. The headquarters of the concern are at 729, 730 and 731 Lumber Exchange, Minneapolis, Minn.

## *NEW STYLE OPERATOR'S CHAIR.*

The Richards Chair-Panel Company, Chicago, sends out a neat circular advertising its telephone operator's chair. Here is a quotation from it: "There are many makes of telephone chairs, each known for some one feature, but on the whole all very similar because the builders, being hampered by limited space, by the necessity for strength, by the simplicity required, by the limited cost, and the prejudice against innovations, lost heart. But now, in the days of airships and wireless telegraphy, we have telephone chairs that fit the back, that are a comfort in any position, that make telephoning a pleasure to both operator and patron, that increase business, that are original in design and unequaled for strength. That are cleanly and that require the minimum of floor space. They are new, but they are a fact. They are an innovation, but can you afford to ignore them?"

## *THE CALLAHAN CABLE ROLLER.*

Construction men all over the country will undoubtedly welcome a cable roller or trolley that is built substantially and will stand the hard knocks that a device of this kind necessarily receives. When Mr. Callahan invented the Callahan cable roller he designed a great advance in the art of stringing overhead telephone and telegraph cable, plan-

Figure 1.

Figure 2.

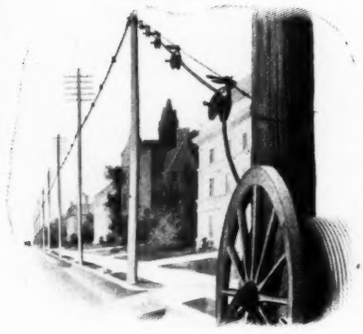


Figure 3.

ning a roller or trolley that should be a money-saver, indeed. It is claimed for it that while weighing but ten pounds it can be clamped on any size messenger wire instantly; there are no bolts or nuts or catches to fool with or to get out of order; nothing has to be undone, or unscrewed in order to get the cable in or out of the roller.

Referring to Figure 1 the reader will see how the roller can be moved out upon the shaft so that the cable can be put into the wheel. The cotter pin keeps it in place. One will also see how the roller clamps onto the messenger. When the eccentric handles are up straight it can be dropped right over the messenger. By pulling the handles down, they clamp tightly upon the messenger and prevent any possibility of slipping. The set screw in the middle can be lowered or raised to make the slat fit any size messenger.

Figure 2 shows a three-quarters view of the roller and gives a very clear idea of its general appearance.

Figure 3 shows the method of using Callahan cable rollers. Two men, it is said, can put up a set of fifty of these rollers in less than a half hour, and after the rollers are in place it is an easy matter to pull up ten to twelve hundred feet in ten minutes. One can therefore readily see why it is called a money saver.

The wheels of the Callahan cable roller are nine inches in diameter and have the edges carefully rounded off to prevent any possibility of marring the cable armor. The whole thing is made of malleable iron, which is designed to stand hard usages. The weight of the roller is ten pounds. The frame is designed so that the lead lines will not get caught between it and the wheel. Mr. Callahan is to be congratulated upon his invention, as it is pronounced a decided advance in the art and as nearly perfect as possible.

For full information, prices, etc., address the manufacturers, W. N. Matthews & Bro., 226 North Second street, St. Louis.

## *AMERICAN ELECTRIC FUSE COMPANY'S BIRTHDAY CELEBRATION.*

The American Electric Fuse Company of Muskegon and New York celebrates this year its fifteenth birthday. The company has planned a unique method of celebrating the passing of the fifteenth year mark. All of the customers of the company are invited to visit the new factory of the American Electric Fuse Company and are assured that they will be given a royal welcome and thoroughly enjoyable time while in Muskegon.

During the coming summer the company plans to entertain a very large number of telephone men and extends the broadest kind of an invitation to all telephone men to "Come to Muskegon." Muskegon has a reputation as a summer resort second to none in the West and the company has a host of fine entertainers among its manufacturing and sales forces. It will be a vacation to any telephone man to visit the American factory this year and attend its year round birthday party and a large number of prominent telephone men have already announced that they are coming, to enjoy the fishing, boating, and picnic entertainments which will be given by the company.

## *INGENIOUS NEW PAY STATION.*

A new invention of great value in the way of pay stations for telephones is being manufactured by the United States Coin Register Company, of Toledo, Ohio, whose offices and engineering departments are with the W. G. Nagel Electric Company. The new cash register and pay station is an ingenious device, having many features heretofore never applied to pay stations. As, for instance, the single gong from which the signals are given in units of five. Every ring of the gong represents a deposit of five cents; as, one ring for five cents, two rings for ten cents, three rings for fifteen cents, five rings for twenty-five cents, and so on, overcoming any possible chance of error or dispute on the part of the user.

Three Coin Pay Station.

The most valuable feature is the recording tape, numbered from one to 2,000 and good for deposits of $100. Every number on the tape represents five cents, and at every ring of the gong a number is moved into the cash box. On opening the cash box for collecting, the tape is automatically cut off at the last number recorded and dropped into the cash box with the money. This gives a true and exact account of all money received. This ticket is then taken with the money to the auditor for his inspection. The number of the pay station is printed on the back of the tape every twenty numbers, which prevents a collection from one pay station being mixed with another. When the first collection is brought to the auditor it is recorded and filed, being held until the next collection. The ticket from the next collection must start to number where the ticket before it was cut off. Should there be any missing numbers it would show the amount the collector was short. The collections continue in the same manner until the tape of 2,000 is used up.

It is said to be the only perfect checking pay station, and the only one making a cash ticket. It is as valuable to a telephone company as a National cash register is to a merchant. From the way the telephone companies are taking hold of this new cash register and pay station, a great benefit is assured the Independent telephone companies through the use of the machine made by the United States Coin Register Company.

## *THE COLMAN J. MULLIN DEVICES.*

Colman J. Mullin, of 430 Kent avenue, Brooklyn, N. Y., who has already made a reputation for himself throughout the telephone field by means of his "Gem" wire or cable grip, continues to produce other practical devices for this class of trade.

Well Hole Guard.

"Mul" Cable Lubricator.

Figure 2.


Figure 3.

Triumph Reel Stand.

Among these may be mentioned his "Triumph" reel stand or jack, which is not revolved by the head as has been the practice heretofore. In the Mullin reel stand the nut re-

volves and the stand proper is not threaded. The advantage in this lies, it is claimed, in the fact that, because of the tremendous strain, the head usually gives out first in other similar devices. The cable funnel also prevents chafing.

Another Mullin specialty is the "Mul" cable lubricator, shown by cut of cans herewith; also the rigid uprights for well holes. The firm also manufactures sheaves for leading out cable, conduit cleaners, conduit mandrels and everything a cable splicer uses.

Particular emphasis, however, is laid upon the "Gem" wire grip of which two illustrations are presented. No. 2 is for pulling out cable, being designed to displace the marline half-hitch. No. 3 is a split grip used for taking up stock.

It is claimed for the "Gem" wire or cable grip that it is superior, because the wire which composes it is of a temper similar to plough steel, being made especially for its construction and because the lay or turn of the strands is the result of many experiments and tests. Probably its best testimonial is the fact that over 10,000 more were sold during the year 1906 than in the year previous.

Mr. Mullin will be pleased to send all parties interested in his specialties a catalogue and price list. His western office at 632 Monadnock building, Chicago, is in charge of Chas. A. Robinson. Inquiries at either office will receive prompt attention.

## *VOTE-BERGER BALLAST SWITCHBOARD.*

One of the most interesting exhibits at the recent Electrical Show was that of the Vote-Berger Company, La Crosse, Wisconsin. Outside of its regular line of apparatus, which is familiar to the telephone public, there was exhibited one complete section of the 3,000 line common battery ballast multiple switchboard that the company is

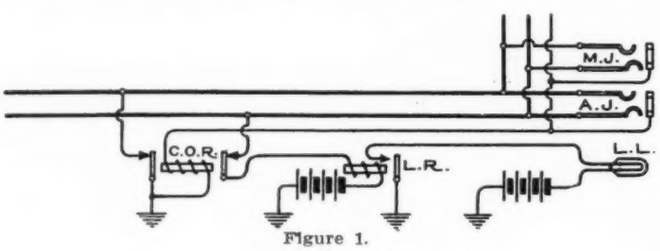



Figure 1.

building for the Minot Light & Telephone Company, Minot, North Dakota.

The company claims the operation of this board is so unique and of so much promise that it merits a detailed description. The design of the board throughout hinges upon the keynote of simplified circuits. In fact, the circuits, taken as a whole, are probably as simple as it will ever

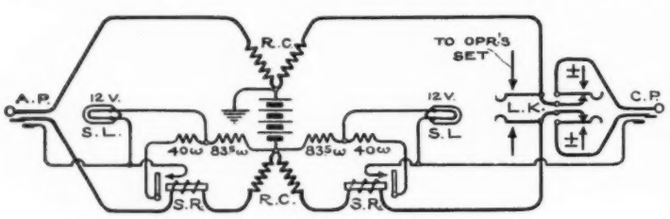



Figure 2.

be possible to make telephone switchboard circuits. When compared with the ordinary relay board circuits there is as much difference between the ballast and the relay circuits as there is between relay and automatic circuits.

Figure 1 shows the line circuit of the No. 1 Bell switchboard. Figure 3 shows the Vote-Berger ballast line circuit. In the Bell circuit, and the same is true of practically all relay switchboards, the lighting of the signal lamp is a secondary operation of the line relay which is controlled by the subscriber's switch-hook. When the subscriber takes his telephone from the hook battery flows through the relay winding the line, through the subscriber's set back to the exchange and other side of the battery.

The relay is thus operated. When the contact of the relay closes, it, in turn, operates the local circuit containing battery and line lamp. When the operator plugs in, battery flows through the sleeve of her cord to operate the cut-

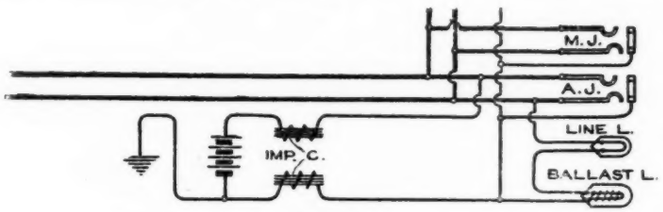



Figure. 3.

off relay, which, on operation, cuts the line relay from the subscriber's line. It will be seen that here are four distinct operations, viz., operation of line relay, illumination of line lamp through relay contact, operation of cut-off relay, removal of line relay by cut-off relay, all of which are merely for the purpose of lighting one lamp and then placing the line in a talking position.

To obtain supervision a relay is placed in the ring side of

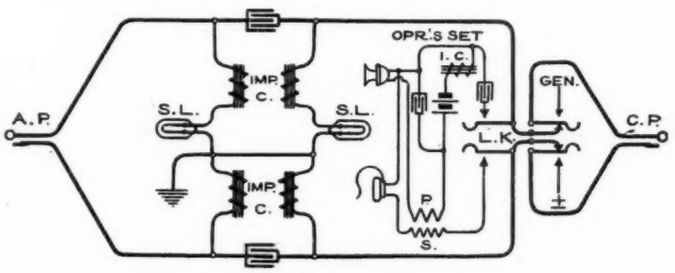
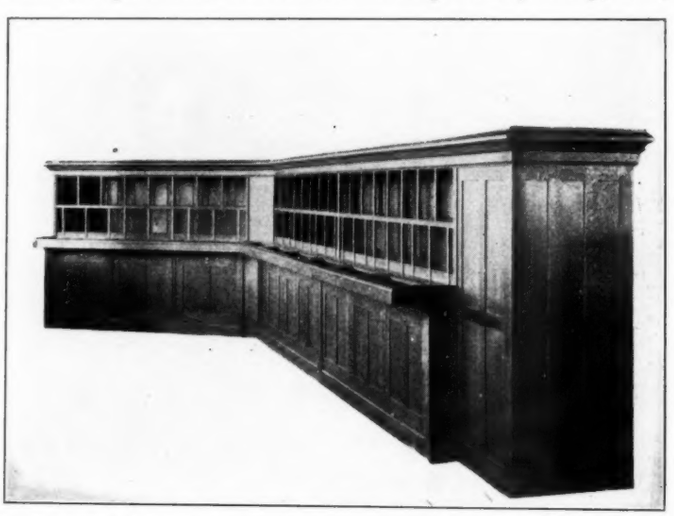



Figure 4.

the cord circuit, Figure 2. This relay is pulled up during conversation and shunts out the supervisory lamp while the contact is closed. The lamp is lighted through the cut-off relay winding when the subscriber hangs up his telephone, thus de-energizing the supervisory relay. This gives us two distinct operations to control the supervisory lamp, viz.,



Frame Work Vote-Berger Ballast Board.

the operation of the supervisory relay and the lighting of the supervisory lamp itself.

In the Vote-Berger ballast board there is only one operation in the line circuit, shown in Figure 3, that is merely the lighting of the line lamp through a straight series circuit. This accomplishes what all signaling circuits are designed

for and does it without introducing any other features. The action is positive and direct.

In the cord circuit, as shown in Figure 4, there is only one operation to control the supervisory lamp. The shunt placed across the cord gives battery current to the supervisory lamp direct without the use of any relays or auxillary circuits. The act of taking the telephone from the hook shunts out this line directly. It will thus be seen that from the time the subscriber calls up to and including the act of the operator answering, there are in the Bell circuit six distinct functions of the apparatus that must take place properly to insure proper results.

In the Vote-Berger ballast circuits there are only two functions for the same operation.

In the Bell circuit there is the following possibilities of trouble:

First. Failure of line relay to operate.

Second. Failure of contact to close after relay has operated.

Third. Failure of cut-off relay to operate.

Fourth. Failure of tip side of line being removed.

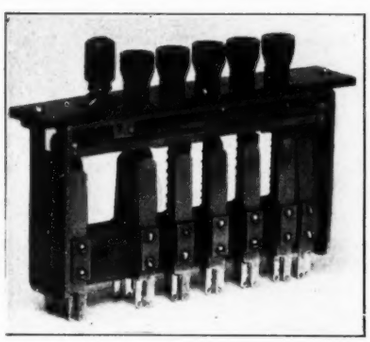
Fifth. Failure of ring side of line being removed.

Sixth. Failure of line lamp lighting.

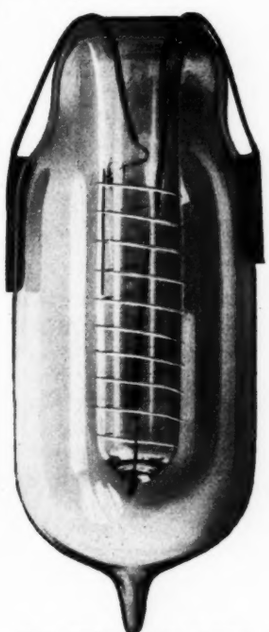
Seventh. Failure of supervisory relay operating.

Eighth. Failure of supervisory relay to fall back when connection is finished.

Ninth. Failure of lamp being shunted when relay operates.



Four Party Line Key Vote-Berger Ballast Board.



V-B Ballast Line Lamp.

In addition there is the possibility of either supervisory or line lamp being burned out.

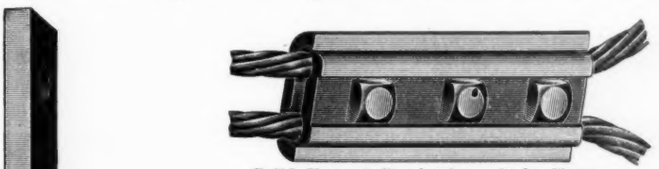
In the Vote-Berger ballast board the only two possible cases of trouble are the possibilities of the line or supervisory lamp being burned out. In addition we should note the number of soldered connections required in the different circuits. In the Bell board we have four soldered connections at the relay, four at the intermediate rack, where the relay is connected, six on the cut-off relay and six on the intermediate rack where the relay is connected, four on the supervisory relay, making a total of twenty-four (24) in addition to the soldered connections to the lamp jacks and answering jacks, which will, of course, be the same as in the ballast board.

The ballast board has merely the straight series connection through the line and through the cord circuit. It has been evident from the time when the ballast board was first introduced that if it worked properly it was the ideal system of the future. From the manner in which the section at the show operated, it is claimed that the board is not only the coming board of the future, but the board of the present as well.

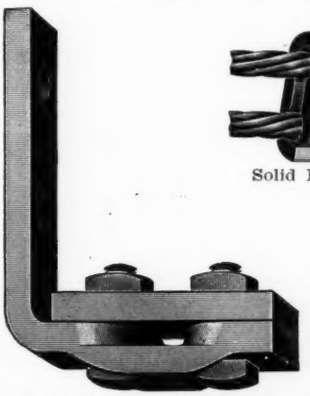
The photographs shown with the article illustrates the appearance of the present installation of the Minot exchange showing the frame work only. The four-party line key and the ballast line lamp give an indication of the workmanship in the board. The multiple jack is not only rigid in construction, but is exceedingly accessible. The very evident fact that the maintenance expense on a board of this type would be far below that of any other board created a great deal of favorable comment among exchange managers and technical men at the Electrical Show.

## *NORTON TOOL COMPANY'S SPECIALTIES.*

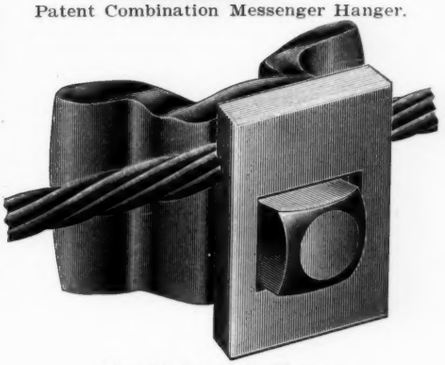
The Norton Tool Company, of West Park, Ohio (a suburb of Cleveland), is considered one of the best known concerns catering to the telephone trade. Its line includes



Solid Forged Steel Three Bolt Clamps.



Patent Combination Messenger Hanger.



The Little Giant Hanger.

Half Oval Two Bolt Guy Shim.

Universal and "Little Giant" messenger hangers, "D" and Regular clamps, pole brackets, window brackets, guying shims, etc. The Norton Tool Company advertises that its product is made of solid forged steel, which is not only non-breakable and economical, but which has been demonstrated to be thoroughly practical and convenient for the purposes designed. Specifications for the lowest grade of steel the firm uses must fulfill the following conditions:

Have tensile strength of not less than 48,000 pounds per square inch of section, and elongation of not less than 15 per cent in 8 inches.

All galvanizing is done by the hot dip process and must stand the established acid test. The company also claims that its bolts are the best because of the extra quality of material and workmanship.

Prompt deliveries are assured, as a large stock of both manufactured and raw material is always carried. Inquiries and orders should be addressed to the Norton Tool Company, West Park, Ohio.

MR. H. C. SLEMIN, formerly of the engineering and sales departments of the Stromberg-Carlson Telephone Manufacturing Company, has taken Mr. J. O. Oliver's place in the advertising department. Mr. Oliver expects to be more closely connected in the future with the sales organization of the company.

# TRADE NOTES.

NOKORODE SOLDERING PASTE is rapidly making its way into the esteem of practical telephone men. Nokorode is not only put up in neat form, but it appears to go farther and work better, so many telephone workmen say, than any preparation yet designed for similar use.

THE DE VEAU TELEPHONE MANUFACTURING COMPANY, 27 Rose street, New York, will remove to a commodious new factory in Brooklyn, April 1. Mr. De Veau and his staff have made a great success of the telephone manufacturing industry in the eastern metropolis.

GORDON D. WILSON, who recently left the purchasing department of the Western Electric Company after ten years of service with the concern and who was for a short time thereafter connected with the Machinists Supply Company, Chicago, is now associated with H. E. Cobb, of 1501 Monadnock block, Chicago.

W. E. STEPHENSON, who for the past two or three years has been connected with H. E. Cobb at Chicago, became associated with the Northern Electric Company at Minneapolis March 1. Mr. Stephenson's many friends in the telephone and electrical fields will wish him all possible success in his new relations.

FRANK B. GRIFFIN, Oshkosh, Wis., is prepared to fill orders for silk-covered magnet wire in any quantities desired. The insulated covering is carefully wound, and the manufacturer believes that his wire will fulfill any requirements necessary to be observed in the winding of high-grade apparatus. He will send full information and prices upon request.

TELEPHONY acknowledges the receipt of a de luxe edition of the New Gray Pay Station Company catalogue. This company has prospered because of its earnest efforts to keep thoroughly up to date and do things right. Its new catalogue, which can be obtained on application to the company's headquarters at Hartford, Conn., is only another evidence of the concern's successful policy—"We believe in the best."

THE INTERNATIONAL TEXTBOOK COMPANY, proprietors of the International Correspondence Schools, Scranton, Pa., has prepared a souvenir anniversary book, containing the addresses delivered at its fifteenth anniversary celebration held last October. The book explains in an interesting way the method of education, the success with which it has met, and shows the advantages of technical education to those unable to go to college.

THE H. P. RUSTLESS CABLE HANGER can be had of H. P. Copeland, 200 W. Broadway, New York. This hanger is made of one piece of sheet zinc. There is, therefore, no danger of electrolytic action taking place, it is claimed, between separate parts and there are no loose parts to become separated or lost. It is very simple and quickly applied. The hanger cannot jump off the suspension wire, and it grips the cable tightly and does not allow it to slip.

THE AMERICAN ELECTRIC FUSE COMPANY of Muskegon and New York has recently closed contracts for complete switchboard protector equipments of the new American type "H" protector for the following exchanges: Erie, Pennsylvania; Leavenworth, Kansas; Montevideo, Minnesota; Columbus, Ohio, branch exchange; Holland, Michigan; besides a number of smaller equipments, making a total amounting to over 14,000 pairs of protectors. All these protectors are the new American Type "H," which is meeting with decided favor in the trade.

THE SWEDISH-AMERICAN TELEPHONE COMPANY began making shipments from the new branch at Sioux Falls on February 1, and a number of telephone operating companies in the territory adjacent to that city have placed good-sized orders, appreciating the location of this branch in their midst and enjoying prompt delivery and decreased freight charges. The Swedish-American company is in a position to care for western business with promptness and dispatch, making shipments from Kansas City and Sioux Falls as well as from the factory in Chicago.

THE NEBRASKA ELECTRIC COMPANY, Omaha, Nebraska, has moved to the four-story building at 1207 Harney street, which will be wholly occupied by this concern in the future, thus giving it about four times the capacity which it has heretofore enjoyed. The company has evidently prospered, having found that its increased trade rendered improvements necessary. It will continue to handle a complete line of telephones and telephone construction supplies as heretofore, and will have better facilities than ever for accommodating the trade with good goods and making prompt shipments.

THE STANDARD VARNISHING WORKS, 29 Broadway, New York, announces that its waterproof "insulating black," which has been gotten up especially for use in connection with interior wiring, signal telegraph and telephone work, has been approved by the Underwriters' Laboratories of Chicago, which concern passes on the various electrical appliances and materials used in wiring construction. This material is being used extensively for wiring and construction work and has received the recommendation of prominent engineers and construction concerns on account of its ability to dry quickly and at the same time retain its plastic and water-proofing properties. This material at the same time possesses high insulation, is easy to work and is free from all objectionable odor.

THE CENTRAL TELEPHONE & ELECTRIC COMPANY of St. Louis and Dallas have just shipped two carloads of construction material to be used by the municipal telephone plant at Edmonton, Alberta Province, Canada; also two 100-drop switchboards and complete equipment for exchanges in Mexico. Shipment of thirty-five cable terminals to Brazil on one order, and four other orders for Brazilian points for Becker cable terminals and other special protective devices show the foreign demand for these products. The company now has one order for over fifty terminal heads to be shipped to an operating exchange in Texas, and reports that its protector department, as well as other departments, is working over time to keep up with the orders.

AMONG THE TELEPHONE COMPANIES that have recently placed their orders with the Swedish-American Telephone Company, for exchange equipment are the following: Fulton Mutual Telephone Company, Fulton, Ill.; St. Mary's Telephone Company, St. Mary's, Iowa; Johnson County Home Telephone Company, Adams and Tecumseh, Neb.; Farmers' & Merchants' Telephone Company, Persimmons, Okla.; Templeton Telephone Company, Templeton, Iowa; Page Independent Telephone Company, Page, Neb.; Grant

Co. Telephone Company, Silver City, N. M.; Glenn View Telephone Company, Blue Hill; Kearney County Telephone Company, Norman, Neb.; Emerson Telephone Company, Emerson, Ark.; Wessington Springs Telephone Company, Wessington Springs, S. D.

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HAVING BECOME the sole importers of the well known battery carbon products of Fabius Henrion, of France, in the United States, and being prepared to offer the trade these products, battery carbons, carbon-flour, as well as enclosed arc lamp carbons, at very satisfactory prices, the French Battery Company announced that it has changed its name to that of the French Battery and Carbon Company. The company is also in direct touch with producers of manganese, graphite, chemicals, and in fact everything which enters into the manufacture of dry batteries, and is willing to quote prices on anything in this line. The French Battery and Carbon Company keeps a sufficient stock of imported materials in its warehouse in New York City, to protect customers against delays in shipments from abroad. Inquiries regarding arc lamp carbons should be addressed to its New York office, 59-61 Park place. The company is pleased to handle all business pertaining to the manufacturing of dry batteries and to dealings in battery supplies from its factory in Madison, Wisconsin. The company thanks the trade for the cordial reception which "Fleur de Lis" dry cells have found on the American market and will be pleased to be of further service to buyers.

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THE LONG DISTANCE TELEPHONE MANUFACTURING COMPANY, of South Bend, Indiana, is now mailing its new general catalogue, 1907 edition, to all who desire a copy. This catalogue is a very fine edition, both from the standpoint of engineering description and the artistic make-up in general. The cover is of handsome blue Westminster paper, printed in three colors. In addition to the two hundred handsome half-tone illustrations, a full and comprehensive description of each and every part manufactured by the company is given in short, terse composition. To those who contemplate entering the telephone field or for those who are looking for new equipment, this catalogue is especially designed, as it gives a complete engineering description and illustration of all the different parts of each instrument. It is the last of a series of six publications issued during the last six months, and is the culmination of a successful sales campaign carried on under the direct and personal supervision of Mr. S. A. Duvall, vice-president of the company. The company takes this opportunity to give full credit and thanks to the efforts and efficient advertising space of TELEPHONY, which has been largely instrumental in developing the rapidly increasing business of the company.

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## *THE FRENCH BATTERY & CARBON CO.*

The French Battery & Carbon Company, manufacturers of the "Fleur de Lis" dry batteries, at Madison, Wisconsin, announces that it has become sole importers of the renowned battery carbon products of Fabius Henrion, Nancy, France, for the United States, and is prepared to offer the trade the products of said concern, including battery carbons and carbon-flour, as well as enclosed arc lamp carbons, at very satisfactory prices. Readers will note a change of name from the French Battery Company to the French Battery & Carbon Company. This firm states that it is also in direct touch with producers of manganese, graphite, chemicals, and, in fact, everything which enters into the manufacture of dry batteries, and would thank customers to allow it to quote them on anything in this line. It will be always the company's aim to keep a sufficient stock of imported materials in its warehouse in New York City, to protect its customers against delays in shipments from abroad. Inquiries regarding arc lamp carbons should be addressed to the New York office, 59 to 61 Park place, while all business pertaining to the manufacturing of dry batteries and to dealings in battery supplies will be cared for at the factory in Madison, Wisconsin. The French Battery & Carbon Co. wishes to thank the trade for the cordial reception with which the "Fleur de Lis" dry cells have met in the American market and particularly from the telephone trade.

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## *PLATINUM RIVETS.*

Economy in the use of platinum is an object much sought by telephone manufacturers. Baker & Company, Inc., Newark, N. J., claim that their platinum rivets are made in such a form that their use for contact points makes it possible to effect a saving. By the time they are in place the cost of points made from these rivets is said to be lower than when wire is cut, finished and in place. This saving comes from the fact that with the rivets it is necessary to do no cutting of material to fit the contact point into the recess provided for it, and that the cost of labor in setting the points may be made very low.

The company issues a sheet showing dimensions of a great many standard sizes which it manufactures, covering a sufficient range to be adapted to practically all purposes of the manufacture of telephone apparatus. This list and full information will be sent by the company upon receipt of a request.

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## *A NEW VISUAL SIGNAL.*

The Monarch Telephone Manufacturing Company of Chicago is advertising its central energy visual signal as the tools for the manufacture of this article are now completed and visual signal boards can be furnished promptly. A catalogue describing the signal is being prepared and will be ready for distribution within a very short time. The Monarch characteristics, which are always so very apparent in equipment produced by this company, are noticeable in the new visual. It is so constructed that the coil or the armature can be removed without breaking any soldered connections. The desirable features of the Monarch magneto drop and jack are embodied to a great extent in this central energy line signal.

The Monarch company is advertising the signal as a new piece of apparatus without fear of anyone criticizing it on that account. The reputation that Monarch equipment has secured in the past is considered a recommendation which every buyer realizes and acknowledges, so no hesitancy is shown by the concern in proclaiming this new device as new. Requests for information and prices will be answered promptly if addressed to the Monarch Telephone Manufacturing Company, Chicago, Illinois.

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## *AMERICAN ELECTRIC FUSE COMPANY INCREASES FACTORY CAPACITY.*

The American Electric Fuse Company, which only moved into its new factory at Muskegon, Michigan, in the summer of 1905 is already so crowded in its manufacturing departments owing to the great increase in the company's business, that plans are out for a new building in extension of the present plant. The company now employs approximately four hundred workmen and is doing business in excess of half a million dollars per annum.

The American Electric Fuse Company's sales department has always been very aggressive. Its advertising has been good and strong and the company enjoys the enviable record of fair dealing with its customers. The year 1907 promises to be even larger than 1906, which was the largest year in the history of the company.

## *"SEEING IS BELIEVING."*

Probably it has never occurred to many readers that it would be an advantage to see what their anchorage looks like after it is set and they are ready to put the strain upon it.

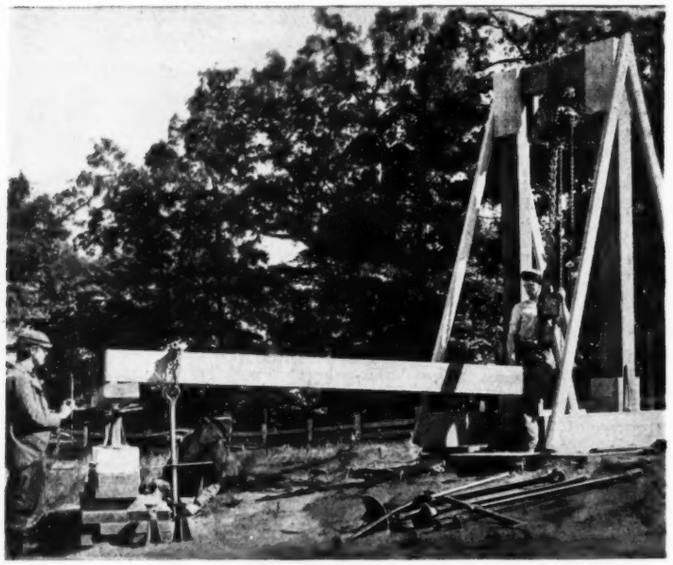


Figure 1.

Did you ever wonder what your "dead-man" or other anchorage looked like after it is covered by the ground? No doubt many people have wondered why it is that the Stombaugh guy anchor holds such enormous strains; why it was that Professor R. C. Carpenter, of Cornell University, after seventy odd dyametric tests found the five-inch anchor would hold 12,500 pounds when bored into the ground five feet; the six-inch anchor 15,000 pounds; the eight-inch anchor 20,000 pounds; the ten-inch anchor 25,000 pounds; and the twelve-inch anchor 30,000 pounds.

The photographs shown herewith enable one to see how these enormous holding powers are possible. Figure 1 shows the apparatus with which Professor Carpenter tested the Stombaugh guy anchor. Figure 2 shows a photograph of a twelve-inch Stombaugh guy anchor from which half of the clay into which it was screwed was carefully taken away. By close examination one can see where the helix or screw passed through the clay, and will note that the solid clay was not disturbed while the anchor left practically no trace of where it went in. It literally "goes into a hole and pulls the hole in after it." Figure 3 shows the same anchor and clay after the cuts of the helix have been opened out with a putty knife, to more clearly show the downward path of the anchor.

A study of these photographs should convince any "doubting Thomases" of the holding power of this simple time-saver. Engineers use them all over the country because they know just what happens under the ground. They state that they are set after one gets them in five feet, that there is no guesswork about it, no moving parts to break or wear out, nothing to pull back, and no digging.

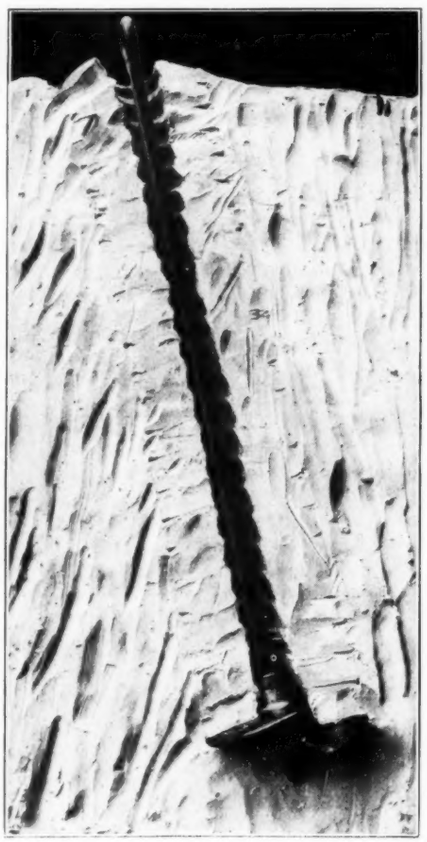


Figure 2.

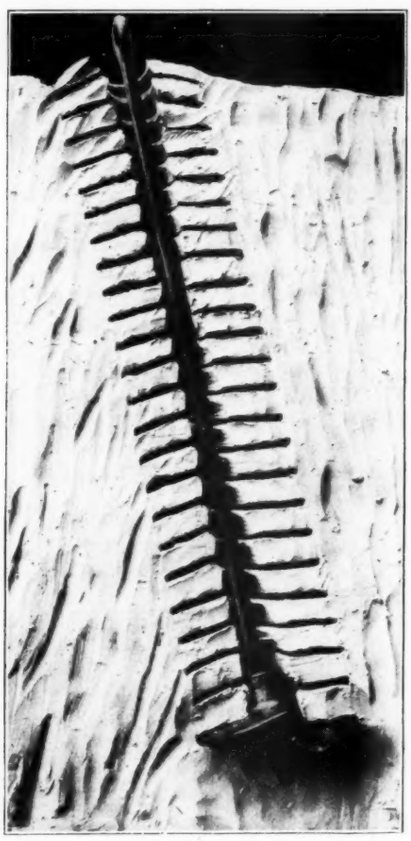


Figure. 3.

The manufacturers, W. N. Matthews & Bro., 226 North Second street, St. Louis, will gladly furnish further information and a report of Professor Carpenter's tests.

## *NEW POLE CONCERN INCORPORATED.*

The increasing scarcity of white cedar and the difficulties experienced by many small dealers in procuring satisfactory stocks has led of recent years to more or less centralizing in the pole producing industry.

One of the most interesting of recent developments in this important field was the incorporation some weeks ago of the W. C. Church Lumber & Coal Company, with headquarters at Des Moines, Iowa. This concern, headed by practical cedar men of mature experience and established reputation, is bringing to the attention of many buyers throughout the telephone field "an attractive proposition whereby they may become stockholders in the concern and thus not only participate in the financial benefits accruing from vigorous and intelligent operations in the cedar field but be assured of a future supply of poles for their own purposes and those of their friends."

The W. C. Church Lumber & Coal Company states that such proportion of its capital stock as was reserved for sale in the process of organization could readily have been disposed of in a lump to local parties, but it was considered better policy to allot same in smaller quantities to leading cedar consumers who might be interested in a proposition of this kind.

This programme is already an assured success; a large portion of the authorized capital has been subscribed and paid in. Stock is held by both lumber dealers and telephone companies, including a number of eminent and influential men in various parts of the country who will be personally interested in helping it to attain all possible success. With this additional capital it is proposed to buy extensively of standing timbers while available and thus insure a supply

for many years to come. In other words, the W. C. Church Lumber & Coal Company proposes to "stay to the finish" and furnish its customers with the best quality of cedar.

The company is officered by W. C. Church, president and general manager; F. L. Townsend, vice-president; W. K. Jones, secretary, and J. D. Whisenard, treasurer. As to the company's responsibility, ability and integrity, it refers to the Central State Bank of Des Moines, Iowa, and the Lumbermen's National Bank, of Bemidji, Minnesota, both of which banks have examined the company's contracts, watched its progress and know of the business methods, past success and future possibilities of the concern.

Every branch of the business, the company states, is under the superintendency of expert cedar men. The company produces what it sells and ships what it invoices; it owns its own land and cuts the timber in season, thereby producing the best quality of cedar. Having a large concentrating yard, insures stock for shipment of all orders in straight or mixed cars at all times. The company offers every advantage to be derived by dealing direct from stump to line at minimum prices, thus obviating all chance of inferior grades, insuring prompt shipments and avoiding jobbing speculation on orders as well as uncertainty of delivery.

Mr. Church established, managed and carried on the successful business of Church-Deal Company for a number of years, and severed the copartnership thus formed to organize a stronger company and enter the field on a larger scale. He needs no introduction to the trade.

Certainly, the W. C. Church Lumber & Coal Company is making a strong bid to become one of the prominent factors in the cedar industry.

## *FIRE UNDERWRITERS' RULES FOR INSTALLING TELEPHONE PROTECTORS.*

Two or three months ago the American Electric Fuse Company, of Muskegon, Michigan and New York, announced in TELEPHONY that it would send free to any inquirer a copy of the National Underwriters' specifications for installing telephone protectors. The result of this announcement has been an astonishingly large number of requests for the book.

The Fuse company reports inquiries received up to the night of February 20 for these Underwriters' Rules numbering 1,288, which indicates two things very clearly. First, that TELEPHONY as an advertising medium is unsurpassed, and second, that the American Electric Fuse Company's booklet fills a long-felt want.

The American Electric Fuse Company as usual is right at the front in getting out new and interesting things in the telephone field.

## *OF INTEREST TO NORTHERN TELEPHONE TRADE.*

The Northwestern Electric Equipment Company of St. Paul, Minn., has a handsome new telephone catalogue now in process of preparation and expects to have it ready to mail about February 15. Interested parties are invited to send in their applications at once. The Northwestern Electric Equipment Company has for some time past been formulating arrangements for the telephone trade, and will be found in a position to fill promptly from a fine stock orders for wire, anchors, insulators, braces, distributing rings, lightning arresters and other construction supplies. The establishment is especially well situated as regards wire, carrying constantly from five to ten cars of the American Steel & Wire and Jno. A. Roebling's products. The company is the agent for the celebrated Security Pole Houses. Mr. A. J. Anderson, manager of the supply department, formerly was with the Manhattan Electrical Supply Company, and has had wide experience in the supply business in both the telephone and general electrical field.

## *SUCCESSFUL KANSAS CONVENTION.*

The annual convention of the Kansas Independent Telephone Association was held at Topeka, February 5 and 6, and proved an unqualified success in every particular. More than 150 delegates were present, representing every section of the state, and derived material benefit from the meeting. The convention met in the new home of the Independent Telephone Company of Topeka, which acted as host, and accommodated the visitors in every way desired. The enthusiasm manifested by those in attendance was unbounded and promises marked development for the Independent movement in Kansas.

The convention was called to order by W. H. Nelson, of Smith Center, president of the association, and W. P. Hemphill, of Topeka, was appointed temporary secretary, as F. M. Pearl, secretary of the association, was absent. President Nelson called attention to the fact that most Independent companies are owned by local stockholders, and not controlled by outside capital. He urged the association to employ a competent, reliable man to look after its interests continuously, and also recommended quarterly meetings of the executive committee, the members of which should be paid their expenses. A motion to appoint committees on resolutions and auditing was carried, and the committees named were: Resolutions, J. M. Doyle, Charles Henderson, A. T. Rogers; auditing, C. L. Brown, H. G. Miller and J. S. Zimmerman.

The vice-presidents of the various districts reported for their territories and showed all to be in good condition. J. M. Doyle, of Belleville, was appointed to represent the association before the legislative committees of the general assembly with reference to bills affecting the telephone situation. After a full discussion it was also decided to authorize the executive committee to employ a traveling secretary to work under the direction of the committee.

When the convention reached the election of officers the following slate was adopted unanimously: President, W. H. Nelson; secretary, W. P. Hemphill; treasurer, C. L. Brown. President Nelson selected the following executive committee: A. T. Rogers, Beloit; J. E. Byers, Ottawa; C. C. Van Deventer, Kingman; C. E. Betts, Atchison, and J. M. Doyle, Belleville. Senator Noftzger was invited to address the convention on the telephone legislation pending before the legislature, and explained his bill to compel telephone companies to exchange messages. He emphatically declared he had no intention of injuring the Independent movement and agreed to amend his bill so it would apply only to long distance connections. The Independents in Kansas are in control of the situation so well that it is firmly believed that no adverse legislation will be passed in that state. The Topeka convention adjourned with the members confident that the coming year will bring the movement unparalleled success.

George Cardwell, a telephone lineman at West Chester, Pennsylvania, made an odd discovery and at the same time met with a surprise while "shooting trouble". Cardwell climbed to the top of a big pole near Chester Heights and opened a cable box when he was surprised by three small animals darting about. He nearly fell from the pole, but managed to catch one of them and found it was a flying squirrel. The animals had a neat nest in the box, and he did not disturb them further. There may have been others in the family which were away from home at the time of his visit.

"We often find sparrows or other small birds in the boxes," he said, "but this was the strangest find I have ever made, and I did not disturb the animals, as they can do no harm."

# ITEMS FROM THE RURAL LINE DISTRICTS

Illustrated by O. H. Brandenburg

Geo. Bestor and E. N. W. S. were fixing up telephone lines Saturday afternoon. We don't see why the farmers can't get their heads together and in some way get better phone service.—*Prairie Queen Correspondence, Preston (Minn.) Times.*

Frank Boyd, general manager of the Independent telephone system of Rockville, was in the city Monday evening with several members of his Sunday school class. The party called to see how the Tribune is made.—*Terre Haute (Ind.) Tribune.*

Jack Mast and O. Fisher are stringing the wires for the Little Laramie Telephone Co.'s line. There are about nineteen patrons on the line who will have connection with the Laramie exchange when the line is completed.—*Laramie (Wyo.) Boomerang.*

Ole Kittelson, long distance lineman for the Northwestern Telephone Exchange Company, left last evening for Blackduck to make some repairs on the long-distance line near there. There was a break in the line between the "Duck" and Hines.—*Beveridge (Minn.) Pioneer.*

Manager W. F. Westfall is looking for a carload of Chestnut telephone poles this week. This is a strong indication that the Independent Telephone Company is in a healthy and prosperous condition, for they already have more phones than any other system in Grayville and are growing daily.—*Grayville (Ill.) Independent.*

L. H. Myers of Rensselaer, Ind., was here over Christmas visiting his son George of the telephone company. Mr. Myers owns three fine farms near Rensselaer and reports good crops this year, corn on his place averaging 50 bushels and oats 60 bushels. He reports there is still a good deal of corn to husk. Mr. Myers is much improved in health.—*Washington (Ill.) Post.*

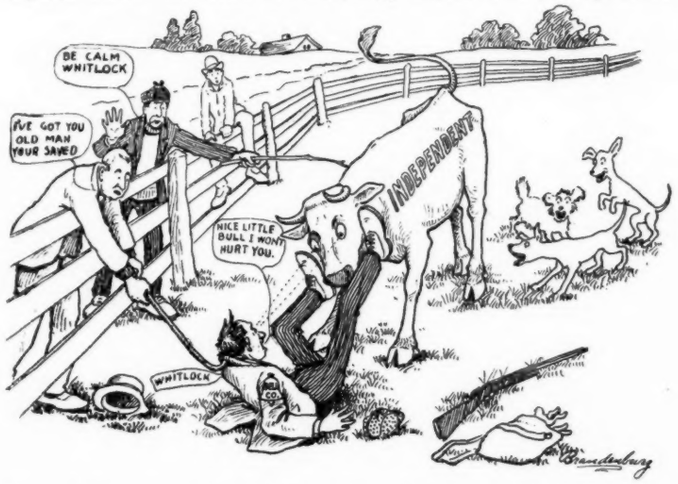
Lewis Noel is having the Dunlaps Telephone Mutual line extended to Epriam Sigerfoos' house. Mr. Noel is a stockholder. Anyone wishing to inform the correspondent of anything please 'phone to Mr. Noel's. We will get it all right. Not later than Wednesday morning, for Mid-Week. Fires, accidents, deaths or sudden sickness will be phoned direct to office.—*Goshen (Ind.) Times.*

A few days ago the Hudson River Telephone force was obliged to look after trouble on the line to Goshen. Just beyond South Centerville, in Greenville, the men found that an owl had become tangled in the wires cutting off the service. The wings were spread out fully and the men had to tear the body from the wires. Whether the owl died from an electric shock or from starvation and exhaustion is not known.—*Port Jervis (N. Y.) Gazette.*

Officers, by order of the city councilmen, stopped the work on the long distance telephone line Monday evening. The action was taken on complaint of residents along the line who are opposed to the crooked poles that are being erected. They are so crooked that even the most sober citizen begins to zig-zag at the very sight of them. One of the councilmen said this morning that he feared

that even the lightning would be ashamed to follow them. It is said that the superintendent of the company will arrive this evening to settle the matter with the city.—*Huntington (Ind.) News-Democrat.*

A. J. Whitlock, manager of the Bell Telephone Company at Alliance, and E. R. Roach of Alliance, and F. E. Lynn and W. J. Monnot of this place, with numerous dogs, etc., put in a busy day in hunting bear near here to-day and as a result, got 59 rabbits and 23 quail. In his perambulation Mr. Whitlock came near being gored to death by a vicious bull, and would no doubt have been seriously injured had it not been for the timely arrival of his companions.




One of the supposed rabbits was brought in dressed by the boys, which had the appearance of dressed lamb, but when questioned, the boys refused to discuss the matter and was referred to James Amerman as referee.—*Ravenna Correspondent in Alliance (Ohio) Star.*

A Jamestown lad called up the central telephone office and asked to be placed in connection with Santa Claus. He was told the good saint was out just then. This failed to faze the lad, who immediately called out: "Give me his mother, then."—*Jamestown Correspondence, Buffalo (N. Y.) Times.*

J. B. Walling of Spring Valley, the jolly good fellow who tries his best to keep the Northwestern telephone lines out of trouble, was called down the Branch Monday. He straightened things out as he always does and found time to jolly the printer a bit before returning home on the evening train.—*Preston (Minn.) Times.*

The Clear Fork Telephone Company held its quarterly business meeting at Morrison Burkhardt's in North Bridgewater Wednesday, and regaled themselves and families with oysters and other good things. The day was much enjoyed but would have been more so if all on the line could have been present.—*Amboy Correspondence, Hillsdale (Mich.) Standard.*

Monday morning telephone line number 28 was put out of commission by a common door key having been hung on the telephone. The key happened to be hung so it touched the transmitter and the entire line was dead for some time. The incident happened at the Philip Walters residence. Be careful and keep any kind of metal from your telephone.—*Hicksville (Ind.) News.*

Word has been received from Grandview that Jones Johnson, an eighteen-year-old boy, has perfected a wireless telegraph, on which he has been working for several years, and that a company has been formed to manufacture the instruments, which, it is said, can be sold for $5 each, and which, it is claimed, will revolutionize the telephone system of the country.—*Jasper Correspondence, Indianapolis (Ind.) News.*

It seems that some of the Wearies of Peshtigo have come to the conclusion that the Wisconsin Telephone Co. have placed phones in the several direct places in our city for their special amusement. Now this is not the case, however, and we hope that those parties will take a tumble and find some more profitable occupation to devote their time to. People who have phones do not care to be annoyed unnecessarily by the ringing of their phones. Now, if parties participating in this kind of sport would please drop the notion, it would be a great accommodation to the subscribers as well as to the company.—*Peshtigo (Wis.) Times.*